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Field Production and Big Remotes

When you see one of those big television trailer rigs pull up and production crews unloading cameras, microwave dishes, miles of cable, and other pieces of television equipment, you know that a big remote is in the offing. Why undergo such an effort when you could simply grab a few small camcorders to shoot the same field event? This chapter provides some answers.

Section 20.1, ENG, EFP, and Big Remotes, looks at these three field production methods individually. Section 20.2, Covering Major Events, offers further information about standard television setups of sports remotes and other field events; how to interpret location sketches; major field communication systems; signal transport; and cable distribution.

KEY TERMS

big remote A production outside the studio to televise live and/or record live-on-tape a large scheduled event that has not been staged specifically for television. Examples include sporting events, parades, political gatherings, and special hearings.

direct broadcast satellite (DBS) Satellite with a relatively high-powered transponder (transmitter/receiver) that broadcasts from the satellite to small, individual downlink dishes; operates on the Ku-band.

downlink The antenna (dish) and equipment that receive the signals coming from a satellite.

field production All productions that happen outside the studio; generally refers to EFP.

instant replay Repeating for the viewer, by playing back videotape or disk-stored video, a key play or important event immediately after its live occurrence.

Ku-band A high-frequency band used by certain satellites for signal transport and distribution. The Ku-band signals can be influenced by heavy rain or snow.

location sketch A rough map of the locale of a remote telecast. For an indoor remote, the sketch shows the room dimensions and the furniture and window locations. For an outdoor remote, the sketch indicates the location of buildings, the remote truck, power source, and sun during the time of the telecast.

microwave relay A transmission method from the remote location to the station and/or transmitter involving the use of several microwave units.

mini-link Several microwave setups that are linked together to transport the video and audio signals past obstacles to their destination usually the television station and/or the transmitter.

remote A large television production done outside the studio. Also called a *big remote*.

remote survey A preproduction investigation of the location premises and the event circumstances.

remote truck The vehicle that carries the program control, the audio control, the video-recording and instant-replay control, the technical control, and the transmission equipment.

satellite news gathering (SNG) The use of satellites to transport the video and audio of live or recorded news stories from a remote site to the station.

satellite news vehicle (SNV) A small truck whose primary function is to uplink an ENG signal to a satellite. May also contain VTRs and modest editing facilities.

uplink Earth station transmitter used to send video and audio signals to a satellite.

uplink truck Small truck that sends video and audio signals to a satellite.

When a television production happens outside the studio, we call it a **field production**. We normally distinguish among **ENG** (*electronic news gathering*) that covers daily news events, **EFP** (*electronic field production*) that deals with smaller scheduled events, and **big remotes** that are done for major events, such as sports and parades.

There are advantages to taking a production out of the studio and into the field:

- You can place or observe an event in its real setting or select a specific setting for a fictional event.
- You have a great number and variety of highly realistic settings to choose from.
- You can use available light and background sounds so long as they accomplish your technical and aesthetic production requirements.
- You can save on production people and equipment, as many EFP productions require less equipment and crew than similar studio productions (unless you do a complex EFP or a big remote).
- You avoid considerable rental costs for studio use and, if you work for a station, studio scheduling problems.

There are disadvantages as well:

- You are always location dependent, which means that some locations require the close cooperation of nonproduction people. For example, if you shoot on a busy downtown street, you will need the help of the police to control traffic and onlookers.
- When shooting on city, county, or federal property, you may need a permit from these agencies plus additional insurance stipulated by them.
- You do not have the production control the studio affords. Good lighting is often difficult to achieve in the field, both in indoor and outdoor locations, as is high-quality audio.
- On outdoor shoots, the weather always presents a hazard. For example, rain or snow can cause serious delays, simply because it is too wet or too cold to shoot outside. A few clouds may give you considerable continuity problems when the preceding takes showed clear skies.
- Field productions also normally require crew travel and lodging as well as equipment transportation.

Nevertheless, the production efficiency of shooting in the field usually outweighs these relatively minor disadvantages, especially in ENG and EFP. Although ENG and EFP have been discussed throughout this book, the focus here is on their specific field production requirements.

▶ **ELECTRONIC NEWS GATHERING**

ENG and ENG production features

▶ **ELECTRONIC FIELD PRODUCTION**

EFP preproduction, production, and postproduction

▶ **BIG REMOTES**

Remote survey; production procedures by director, floor manager, and talent; and various post-production tasks

ELECTRONIC NEWS GATHERING

ENG Electronic news gathering is the most flexible remote operation. As pointed out in previous chapters, one person with a camcorder can handle a complete ENG assignment, so long as the story does not have to be transmitted live. But even if the signal has to be relayed back to the station or transmitter, ENG requires only a fraction of the equipment and people of a big remote. Sometimes, the *shooter or videographer* (news camera operator) will also take care of the signal feed from the camcorder or news truck to the station.

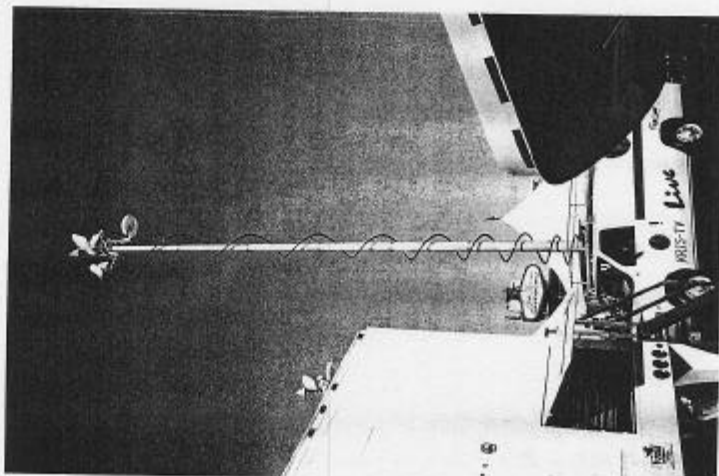
ENG Production Features

The major production features of ENG are the readiness with which you can respond to an event, the mobility possible in the coverage of an event, and the flexibility of ENG equipment and people. Because ENG equipment is so compact and self-contained, you can get to an event and videotape or broadcast it faster than with any other type of television equipment. An important operational difference between ENG and EFP or big remotes is that ENG requires no preproduction. ENG systems are specifically designed for immediate response to a breaking story. In ENG you exercise no control over the event but merely observe it with your camcorder as best you can.

Even when working under extreme conditions and time restrictions, experienced shooters can quickly analyze an event, pick the most important parts of it, and videotape pictures that edit together well. For important events the ENG team normally consists of two people—

the camcorder operator and the field reporter. Many ENG stories are covered by a single shooter and narrated later by the anchor during the newscast. ENG equipment can go wherever you go. It can operate in a car, an elevator, a helicopter, or a small kitchen. Your shoulder often substitutes for the heavy tripods.

With ENG equipment you can either videotape an event or transmit it live. The transmission equipment has become so compact and flexible that even a live transmission can be accomplished by a single camera operator. Most ENG vehicles (usually vans) are equipped with a microwave transmitter, which, when extended, can establish a transmission link from the remote location to the station. **SEE 20.1** When doing a live transmission, you will have to connect the camera cable with the microwave



20.1 ENG VAN

This regular-sized van houses the extendable microwave transmission device and a variety of intercommunications equipment.

Preproduction

Compared with ENG, in which you simply respond to a situation, EFP requires careful planning. Recall that the first step in any preproduction activity is to translate the process message into the most effective and efficient production method—whether to shoot it indoors or outdoors, single- or multicamera, in the normal sequence of events or shot-by-shot. The second step is to translate the chosen production method into specific medium requirements—equipment and people. Assuming that you have practiced this translation of process message into production requirements, we jump to the actual preproduction activities: (1) location survey, (2) initial production meeting, and (3) field production time line.

Location survey To get to know the environment in which the production will take place make an accurate location sketch—a rough map of the locale of a remote telecast. For an indoor remote, the sketch shows the room dimensions and the furniture and window locations. For an outdoor remote, it indicates the location of buildings, the remote truck, power source, and sun during the time of the telecast.

To refresh your memory, take another look at the location sketch of the artist's studio in figure 18.11. This sketch gives important information about lighting and audio requirements, camera positions, and shooting sequences. Although technical preparations may not be your immediate concern, check on the availability of power (wall outlets), the acoustics (small room, reflective walls, traffic noise from nearby freeway), and potential lighting problems (large windows). Location surveys are discussed further in the context of big remotes later in this chapter.

Ask your producer whether he or she has secured accommodations, shooting permits, and parking and food for talent and crew. If the production is really in the field, are the most basic conveniences available?

Initial production meeting The initial production meetings are normally held the day before the shoot and involve all key personnel, including the PA (production assistant), floor manager, and the crew chief or camera operator (shooter). For more-complex field productions that involve several indoor locations, you may want to include the LD (lighting director). At a minimum you should meet with the PA (who may double as the audio/VTR operator) and the camera operator.



20.2 SATELLITE UPLINK VAN
The satellite news vehicle is a portable earth station. It sends television signals to the Ku-band satellites.

playback of the same news story. If something goes wrong with one machine, you can quickly switch over to the next for the same material.

Satellite news gathering is used whenever big and especially newsworthy events are scheduled, such as a presidential election, a summit meeting of heads of state, or the world soccer finals. But the uplink truck is also used locally for the distribution of news stories, national and international teleconferencing, or whenever a signal cannot be sent readily by microwave or cable.

ELECTRONIC FIELD PRODUCTION

As you already know, EFP—electronic field production—uses both ENG and studio techniques. From ENG it borrows its mobility and flexibility; from the studio it borrows its production care and quality control. The following discussion of some of the fundamental steps of field preproduction, production, and postproduction assumes that you are still functioning as the director. This way, you have to deal with production detail that is important for each member of the EFP team, regardless of the specific jobs assigned. **RECAP 20.1**

You can also use such a microwave link to transmit quickly the uncut videotape directly from the cameraman to the station.

SNG Production Features

There is still another "NG" method: SNG (satellite news gathering). SNG has been spawned by the ability of satellites to transport live or recorded ENG signals from a faraway field location to the station. In contrast to normal ENG operations, SNG requires preplanning and setup of the *satellite news vehicle* (SNV), the main purpose of which is to uplink a live or videotaped ENG signal to a satellite. The SNG looks like a small remote truck and contains computer-assisted uplink equipment and, when used for news, one or two VTRs as well as editing equipment. The VTRs can record the camera output and play back the edited or unedited news videotapes for immediate uplinking. **SEE 20.2**

Newspeople prefer uplinking "hot" videotapes (recorded moments before the transmission) to live transmission because it permits repeated transmission in case the satellite feed gets temporarily interrupted or is lost altogether. To further safeguard against signal loss, two VTRs are sometimes used for the recording and

Explain the process message and what you hope to accomplish. Distribute the location sketch and discuss the major production steps.

It is critical that everyone knows the exact location of the production and how to get there. Can everyone fit into the EFP van? Who is riding with whom? Who needs to first come to the station for equipment check-out, and who will go directly to the location? Who will drive the van? Hand out the production schedule and ask the PA to distribute it (fax and/or e-mail) to all other crew members who may not be in the meeting. As you can see, transportation to and from the location is an essential scheduling issue. If the field production is outdoors, what do you do in case of rain? Always have an alternate production schedule ready.

Field production time line A shooting schedule for a fairly elaborate field production may look like this:

TIME LINE: FIELD PRODUCTION	
7:30–8:15 A.M.	Equipment check-out
8:15 A.M.	Departure
9:15 A.M.	Estimated arrival time
9:30–10:00 A.M.	Production meeting with talent and crew
10:00–11:00 A.M.	Technical setup
11:00–11:30 A.M.	Lunch
11:30 A.M.–12:00 P.M.	Technical and talent walk-through
12:00–12:30 P.M.	Notes and reset
12:30–1:00 P.M.	Break
1:00–1:15 P.M.	Segment 1 taping
1:15–1:45 P.M.	Notes and reset for segment 2
1:45–1:55 P.M.	Segment 2 taping
1:55–2:10 P.M.	Break
2:10–2:40 P.M.	Notes and reset for segment 3
2:40–3:00 P.M.	Segment 3 taping
3:00–3:30 P.M.	Spill
3:30 P.M.	Strike
4:30 P.M.	Departure
4:30–4:45 P.M.	Estimated arrival time at station
	Equipment check-in

Production: Equipment Check

Again, tell the crew what is going on and the aim of the production. Go through the production schedule and the rundown sheet of the major locations and taping sessions. Be extra careful when loading the equipment. Unlike studio productions, where all the equipment is at hand,

in field productions you need to bring every piece of equipment to the location. Even if you have done the same EFP a dozen times, always use an equipment checklist. Even a wrong cable or adapter can cause undue delays or the cancellation of the production.

Before loading equipment on a vehicle, check each item to see that it works properly. At a minimum do a test recording of picture and sound before leaving for the location shoot.

Equipment checklist The following equipment checklist is intended as a general guide and may not include all the items you need to take along. Depending on the relative complexity of the EFP, you may need considerably less or more than the items listed. **ASAP 2K**

■ **Cameras** Field camera or camcorders? Have they been checked out? Do you have the appropriate lenses and lens attachments (usually filters), if any? What camera mounts do you need: tripod dollies, clamps, Steadicam mount, high hats, bean bags, portable jib arms? Do you have enough batteries? Are they fully charged? Do they fit the specific camcorders you use in the EFP?

■ **VTR and tape** If you use field cameras instead of camcorders, you need to take one or more VTRs. Do you have the proper videocassettes for the VTRs? Take plenty of cassettes along. Check that the actual tape length matches the label on the box. When you think you have enough tape, add two more cassettes for good measure. Do the cables fit the jacks on the recorder and ENG/EFP camera?

■ **Monitor, RCU, and scopes** You need a monitor for playback or checking the camera's shots. If the monitor is battery-powered, do you have enough batteries? If you do a multicamera EFP with a switcher, each camera input needs a separate preview monitor. If you have a narrator describing the action, you need a separate monitor for him or her. In critical (film-style) field productions for which you use a single high-quality camera, you need an *RCU (remote control unit)*, a *waveform monitor (oscilloscope)*, and a *vector scope* for optimal video. As you recall, the RCU enables you to adjust the camera for optimal performance. The oscilloscope helps you adjust the brightness (keeping the white and black levels within tolerable limits), and the vector scope helps adjust the camera so that it produces true colors.

for lowering the color temperature or the light-blue ones for raising it.

If there are windows to cope with, you may need large sheets of neutral density filters (that cut down the light without changing the color temperature) or orange color media to cover the windows and thus lower the color temperature. Just to be safe, take some muslin along to block unwanted light that may enter through an off-camera window, and a black cloth to cut down unwanted reflections.

Other important items to take along are: light meter, light stands and clamps, sandbags to secure the portable light stands, some pieces of 1 x 3 lumber to construct a light bridge for back lights, a roll of aluminum foil for heat shields, extra barn doors, flags, and a dozen or so wood clothespins to attach scrims or color gels to barn doors.

■ **Intercom** If the single-camera EFP is taking place in a confined area, you don't need elaborate intercom systems. You can call your shots right from the production area. But if the event covers a large outdoor area, you need a small power megaphone and walkie-talkies to communicate with the widely dispersed crew. If you use the multicamera and switcher system, you need headsets and intercom cables.

■ **Miscellaneous** There are a few more items that are often needed for a field production: extra scripts and production schedules; field log sheets; slate and dry-erase marker; regular rain umbrellas and "raincoats" (plastic covers) for cameras; filters, if any (star filters, fog filters); white cards for white-balancing; teleprompter, if any; blank cue cards or large newspaper pad and marker; an easel; and several rolls of gaffer's tape and masking tape. You also need white chalk, more sandbags, clothespins, rope, makeup kit and bottled water, towels, flashlights, a first-aid kit, and cellular phones.

Production: Setup

Once everyone knows what is supposed to happen, the setup will be relatively smooth and free of confusion. Although as a director you may not be responsible for the technical setup, you should watch carefully that the equipment is put in the right places.

For example, when shooting indoors, will the lights be out of camera range? Are they far enough away from

combustible material (especially curtains) or properly insulated (with aluminum foil, for example)? Are the back lights high enough so that they will be out of the shot? Is there a window in the background that might cause lighting problems? (The window in the artist's studio [see figure 18.1.1] would certainly present a problem if you had to shoot the large sculpture.) Does the room look too cluttered? Too clean? Are there any particular audio problems you can foresee? If the talent wears a wired lavaliere mic, does the mic cord restrict talent mobility? If you use a shotgun mic, can the mic operator get close enough to the talent and, especially, move with the talent without stumbling over furniture? Are pictures hung where the camera can see them? Look behind the talent to see whether the background will cause any problems (such as lamps or plants seeming to extend from the talent's head).

When outdoors, check for obvious obstacles that may be in the way of the camera, mic operators, and talent. Look past the shooting location to see whether the background fits the scene. Are there bushes, trees, or telephone poles that may, again, appear to extend from the talent's head? Large billboards are a constant background hazard. What are the potential audio hazards? Although the country road may be quiet now, will there be traffic at certain times? Are there any factory whistles that may go off right in the middle of your scene?

Production: Rehearsals

Walk-through Before you start with the actual rehearsal and taping, you should have a brief walk-through with the crew and then with the talent to explain the major production points, such as camera positions, specific shots, and principal actions. In relatively simple productions, you can combine the technical and talent walk-throughs. The more thorough you are in explaining the action during the walk-throughs, the more efficient the actual videotaping will be. Have the PA follow you and write down all major and minor production problems that need to be solved.

Always follow the walk-through with the notes session, and have the crew take care of the remaining problems. Do not forget to give the talent and crew a short break before starting with the rehearsal and taping sessions.

Rehearsal As pointed out before, single-camera field directing has its own rehearsal technique. Basically, you rehearse each take immediately before videotaping it. You walk the talent and the camera and microphone operators through the take, explaining what they should and should not do. Videotape some of the critical scenes and watch and listen to the playback. You may want to change the mic or the mic position for a better, less noisy pickup. Call for a short break before the actual taping.

Production: Videotaping

Just before the actual taping, ask the camera operator whether the camera is properly white-balanced for the scene location. Sometimes clouds or fog move in between the rehearsal and taping, changing the color temperature of the light. Slate all takes and have the PA record them on the field log.

Watch the background action as well as the main foreground action. For example, curious onlookers may suddenly appear out of nowhere and get in your shot, or the talent may stop her action exactly in line with a distant fountain that then appears to spring out of her head. Listen carefully to the various foreground and background sounds during the take. Do not interrupt the taping because there was a faint airplane noise. Most likely, this noise will get "buried" by the main dialogue or the additional sounds added in postproduction (such as music). But the noise of a nearby helicopter that interrupts a Civil War scene definitely calls for a retake.

At the end of each take, let the camera run and record a few seconds of additional material. This cushion will be of great help to the editor in postproduction. Videotape some usable cutaways and record location sounds and room ambience for each location. The recorded "silence" will help bridge possible audio gaps in postproduction.

When you feel that you have a series of good takes, play them back on the field monitor to see whether they are, indeed, acceptable for postproduction. If you detect gross problems, you can still do some retakes before moving on to the next scene or location. Have the VTR operator or PA keep an accurate field log for each take.

Production: Strike and Equipment Check

Have the location reset (furniture, curtains) the way you found it and the place cleaned before you leave. Pick up all scripts, shot sheets, and log sheets. Do not leave pieces of gaffer's tape stuck on floors, doors, or walls.

When loading the EFP vehicle, the floor manager, crew chief, or PA should run down the equipment checklist to see that everything is back in the vehicle before leaving or changing locations. Check that the source tapes are all properly labeled and—most important—loaded onto the vehicle.

Postproduction

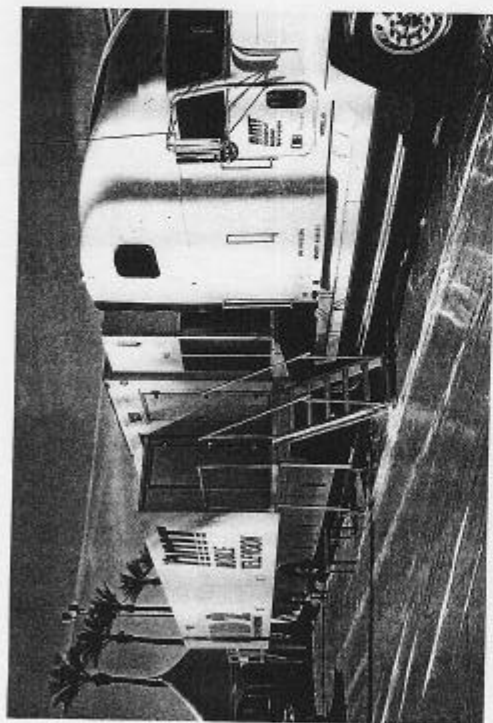
EFP postproduction activities are, for all practical purposes, identical to those of single-camera studio productions: making protection copies and window dubs, logging all takes on the source tapes, doing an off-line rough-cut, and finally an on-line edit on the edit master tape.

BIG REMOTES

A *big remote*, or simply *remote*, is done to televise live or to record live-on-tape large, scheduled events that have not been staged specifically for television, such as important sports matches, parades, or political gatherings. All big remotes use high-quality field cameras (studio cameras with high zoom ratio lenses) in key positions, a number of ENG/EFP cameras, and an extensive audio setup. The cameras and the various audio elements are coordinated from a mobile control center—the *remote truck*. Remote trucks are usually powered by a portable generator, with a second one standing by in case the first one fails. If there is enough power available on the remote site, the truck is connected to the available power, with a single generator serving as backup.

The remote truck represents a compact studio control room and equipment room. It contains the following control centers:

- Program control center with preview and line monitors, a switcher with special effects, a character generator, and various intercom systems (PL, PA, and elaborate I.E.B. systems)
- Audio control center with a fairly large audio console, ATRs and DATs, monitor speakers, and intercom systems
- Video recording center with several high-quality VTRs and/or digital recording devices that can handle regular recordings, do instant replay, and play in slow-motion and freeze-frame modes



20.3 REMOTE TRUCK

The remote truck is a complete control center on wheels. It contains program, audio, video, and technical control centers as well as C.G. and recording facilities.

- Technical center with camera controls, line monitors, patchboards, generator, and signal transmission equipment. **SEE 20.3 AND 20.4**

In very big remotes, one or more additional trailers may be used for supplemental production and control equipment.

Because the telecast happens away from the studio, some of the production procedures are quite different from the studio productions. We therefore examine the following production aspects: (1) preproduction—the remote survey, and (2) production—equipment setup and operation, and floor manager and talent procedures.

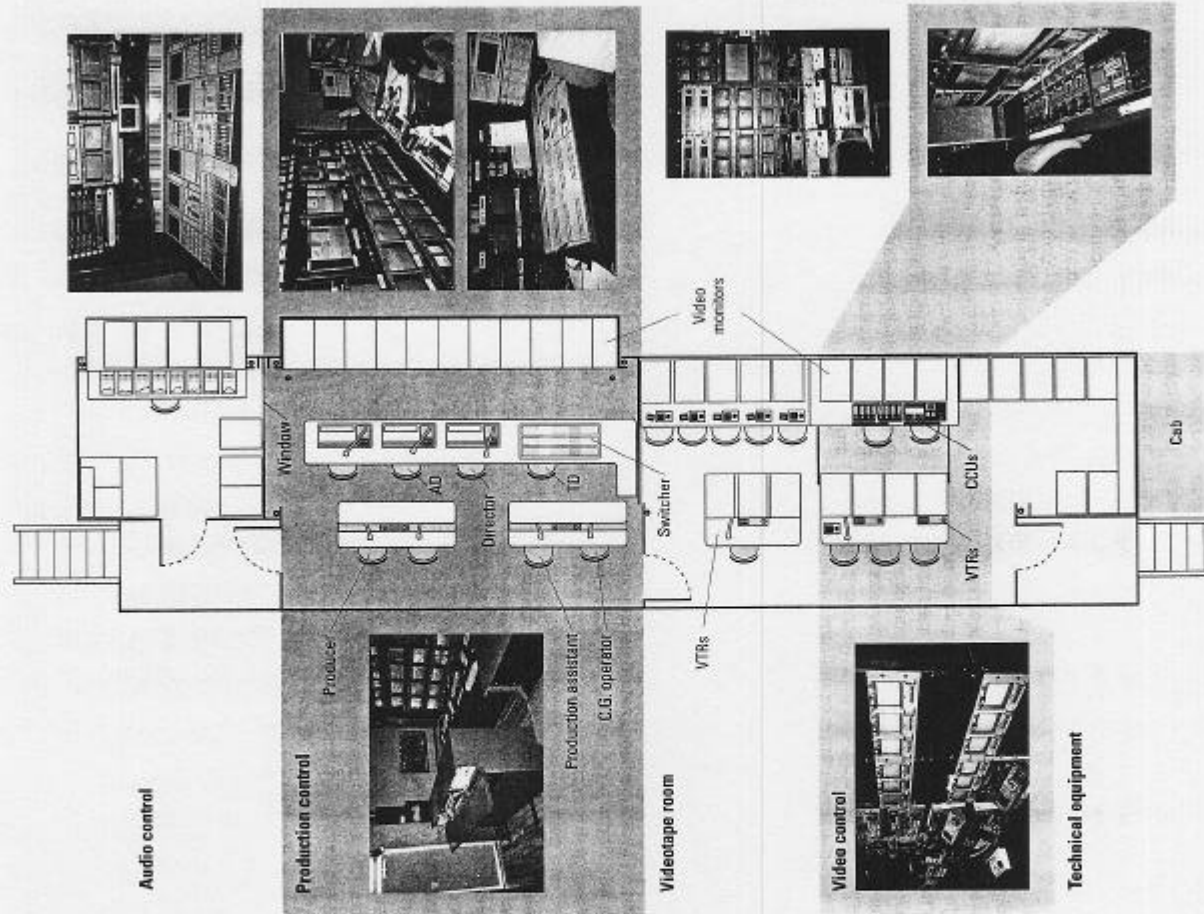
Preproduction: The Remote Survey

Like any other scheduled production, a big remote requires thorough preparation—only more so. One problem with preparing for big remotes is that the event you cover is normally a onetime happening that you cannot rehearse. It would be ridiculous to ask two national hockey teams to repeat the whole game for you, or to ask political leaders to repeat their lively debate verbatim just so you can have your rehearsal. Normally, you have no control over the event itself, but must follow it as best you

can. Your production preparations must take these, and several other such considerations, into account. Still another problem is that you can truck only the control room and the technical facilities to the site—not the studio itself. Cameras, microphones, and often lighting need to be brought to the remote location.

One of the key preparations is the remote, or site, survey. Many of the survey items for big remotes are equally applicable for various nonbroadcast field productions, such as a visit to a car manufacturing plant or an MTV segment. As the name implies, a *remote survey* is a preproduction investigation of the location premises and the event circumstances. It should provide you with answers to some key questions as to the nature of the event and the technical facilities necessary to televise it. Note that the big-remote survey can also be applied to more-ambitious electronic field productions.

Contact person Your first concern is to talk to someone who knows about the event. This person, called the *contact person*, or simply *contact*, may be the public relations officer of an institution or someone in a supervisory capacity. Call the contact to find out what he or she knows about the event and whether he or she can refer you to others who might answer your questions.



20.4 CONTROL CENTERS IN REMOTE TRUCK

The remote truck carries the program control, the audio control, the video-recording and instant-replay center, the technical center, and the transmission equipment.

In any case, get the contact's full name and position, business and e-mail addresses, and business, home, fax, cell phone, and pager numbers. Then make an appointment for the actual remote survey. Ideally, the time of day of the survey should be the same as that of the scheduled remote telecast, because the location of the sun is extremely important for outdoor remotes as well as for indoor remotes where windows will be in the shots. Arrange to have the contact person with you during the production. Establish an alternate contact and copy him or her with information you send to the primary contact.

Survey party The survey itself is concerned with production and technical considerations. The remote survey party therefore includes people from production and engineering. The minimum party usually consists of the producer, the director, and the TD or technical supervisor of the remote. Additional production and technical supervisory personnel, such as the production manager and the chief engineer, may join the survey party, especially if the remote covers an important event and includes such elements as complex microwave or satellite links.

In general, the production requirements are first determined, then the technical people try to make the planned production procedures technically possible. Depending on the complexity of the telecast, extensive compromises must often be made by production people as well as technical personnel.

As a director you can make such compromises only if you know what the particular technical setup and pickup problems are and what changes in procedures will help overcome them. You should therefore familiarize yourself with the production as well as the technical requirements of television remotes. Although many production and engineering survey questions overlap, we will, for better clarification, consider them separately.

Production survey The following figure lists the key questions you should ask during the production survey. **SEE 20.5** Also, a good location sketch can help you prepare for the production and anticipate major production problems (see figures 20.14 through 20.27).

Technical survey The technical survey lists only those items that directly influence the production procedures and, ultimately, your portion of the remote survey. **SEE 20.6** Technical points that have already been

mentioned in the production survey, such as cameras and microphones, need not be listed again.

Production: Equipment Setup and Operation

There is no clear-cut formula for setting up equipment for a remote telecast. As with a studio production, the number of cameras, the type and number of microphones, the lighting, and so forth depend entirely on the event or, more precisely, on the process message as defined in the preproduction meetings. Employing a great number of cameras, microphones, and other types of technical equipment does not necessarily guarantee a better telecast than when using less equipment. In fact, one or two camcorders are often more flexible and effective than a cumbersome remote truck with the fanciest video, audio, recording, and switching gear. For such standard big-remote operations as the live coverage of major sporting events, however, the remote truck provides essential equipment and production control.

Once set up, many of the production routines of big remotes do not differ significantly from studio productions. There are nevertheless some procedures in big-remote operations that you will not find in normal studio productions that are especially important for the director, the floor manager, and the talent. You will also be hard-pressed to find instant replays used in normal studio productions. For the following discussion, let's assume that you are functioning first as a director of a big remote, then as a floor manager, and finally as talent.

Directing the setup Because the actual on-the-air telecast of big remotes is usually live, the directing procedures have little resemblance to the other field production methods. Rather, they closely resemble live or live-on-tape studio productions.

The big-remote setup, however, is similar to that of a complex multicamera EFP and includes all activities before the actual telecast of the remote event. As with EFP, thorough setup planning is essential for the success of a big remote.

■ As soon as the remote truck is in position, conduct a thorough technical walk-through. Tell the technical staff where you want the stationary cameras located and what field of view you require (how close or wide a shot you need to get with each camera). Get the cameras as close to the action as possible to avoid overly narrow-angle

20.5 REMOTE SURVEY: PRODUCTION

These are the key questions you should ask during the production survey.

SURVEY ITEM KEY QUESTIONS

Contact

Who are your principal and alternate contacts? Title, business and e-mail addresses, business and home phone numbers, and fax and pager numbers.

Place

Where is the exact location of the telecast? Street address, telephone number.

Time

When is the remote telecast? Date, time. What is the arrival time of the truck?
What is the production schedule?

Nature of event

What is the exact nature of the event? Where does the action take place? What type of action do you expect? Your contact person should be able to supply the necessary information.

Cameras (stationary)

How many cameras do you need? Use as few as possible. Where do you need the cameras?
Do not place cameras on opposite sides of the action. In general, the closer together they are, the easier and less confusing the cutting will be. Shoot with the sun, not against it. Try to keep it behind or to the side of the cameras for the entire telecast. The press boxes of larger stadiums are generally located on this shadow side.
If possible, survey the remote location during the exact time of the scheduled telecast. If it is not a sunny day, determine the position of the sun as closely as possible.
Are there any large objects blocking the camera view, such as trees, telephone poles, or billboards? Will you have the same field of view during the actual telecast? A stadium crowd, for instance, may block the camera's field of view, although the view is unobstructed during the survey.
Can you avoid large billboards in the background of shots, especially if the advertising competes with your sponsor's product?

Cameras (mobile)

Do you need to move certain cameras? What kind of floor is there? Can the camera be moved on a field dolly, or do you need remote dollies (usually with large, inflatable rubber tires)? Will the dolly with camera fit through narrow hallways and doors? Can you use ENG/EFP cameras instead of large studio/field cameras? What is their action radius? Can you connect them to a remote truck by cable (less chance of signal interference or signal loss), or do you have to microwave the signal back to the remote truck?

20.5 REMOTE SURVEY: PRODUCTION (continued)

SURVEY ITEM KEY QUESTIONS

Lighting

If you need additional lighting, where and what kind? Can the instruments be hung conveniently, or do you need light stands? Do you need to make special arrangements for back lights? Will the lights be high enough so that they are out of camera range? Do you have to shoot against windows? If so, can they be covered or filtered to block out undesirable daylight?

Audio

What type of audio pickup do you need? Where do you need to place the mics? What is the exact action radius as far as audio is concerned? Which are stationary mics and which are handled by the talent? Do you need wireless mics? Otherwise, how long must the mic cables be?
Do you need special audio arrangements, such as audio foldback or a speaker system that carries the program audio to the location? Can you tie into the "house" public address system? Do you need long-distance mics for sound pickups over a great distance?

Intercommunications

What type of intercom system do you need? Do you have to string intercom lines? How many I.F.B. channels and/or stations do you need and where do they go? Is there a need for a P.A. talkback system? Are there enough telephone lines available?

Miscellaneous production items

If a C.G. is unavailable, easels are needed for title cards. Do you need a clock? Where? Do you need line monitors, especially for the announcer? How many? Where should they be located? Will the announcer need a preview monitor to follow special iso playbacks? Do you have a camera slate in case the C.G. cannot be used?

Permits and clearances

Have you (or the producer, if you do not act as producer-director) secured clearances for the telecast from police and fire departments? Do you have written clearances from the originators of the event? Do you have parking permits for the remote truck and other station vehicles?

Do you have passes for all technical and production personnel, especially when the event requires entrance fees or has some kind of admission restrictions?

Special production aids

Does everyone have a rundown sheet of the approximate order of events? These sheets are essential for the director, floor manager, and announcer and are extremely helpful to the camera operators, audio engineer, and additional floor personnel. Does the director have a spotter who can identify the major action and people involved? In sports, spotters are essential.

20.6 REMOTE SURVEY: TECHNICAL

The technical survey lists only those items that directly influence the production procedures.

SURVEY ITEM

KEY QUESTIONS

Power

Assuming you do not work from a battery pack or your own generator, is enough electricity available at the site? Where? You will need at least 200 amps for the average remote operation, depending on the equipment used. Does your contact person have access to the power outlets? If not, who does? Make sure the contact is available during the remote setup and the actual production. Do you need special extensions for the power cable? If you use a generator, do you have another one for backup?

Location of remote truck and equipment

Where should the remote truck be located? Its proximity to the available power is very important if you do not have a power generator. Are you then close enough to the event location? Keep in mind that there is a maximum length for camera cables beyond which you will experience video loss. Watch for possible sources of video and audio signal interference, such as nearby X-ray machines, radar, or any other high-frequency electronic equipment.

Does the remote truck block normal traffic? Does it interfere with the event itself? Reserve parking for the truck. Have you asked the police for assistance? Do you need special RCLs for portable cameras?

Recording devices

If the program is recorded, do you have the necessary VTRs in the truck? Do you need additional VTRs or digital hard drives for instant replay? If you have to feed the audio and video signals back to the station separately, are the necessary phone lines cleared for the audio feed? Do you have enough tape to cover the full event? Have you made provisions for switching reels without losing part of the event? Are your 160 cameras properly patched into the switcher and into separate recording devices?

Signal transmission

If the event is fed back to the station for videotape recording or directly to the transmitter for live broadcasting, do you have a good microwave or satellite uplink location? Do you need microwave mini-links? Double-check on the special requirements for feeding the satellite uplink.

Cable routing

How many camera cables do you need? Where do they have to go? How many audio cables do you need? Where do they have to go? How many intercom lines do you need? Where do they have to go? How many AC (power) lines do you need? Where do they go? Route the cables in the shortest possible distance from remote truck to pickup point, but do not block important hallways, doors, walkways, and so on. Do the cables have to cover a great span? If so, string a rope and tie the cable to it to relieve the tension.

Lighting

Are there enough AC outlets for all lighting instruments? Are the outlets fused for the lamps? Do not overload ordinary household circuits (usually 15 amp). Do you have enough extension cords and distribution boxes (or simple multiple wall plugs) to accommodate all lighting instruments and the power supply for monitors and electronic docks?

Communication systems

What are the specific communication requirements? P.L.s? I.F.B. channels? Telephone lines? Cellular phones? P.A. systems? Long-range walkie-talkies? Two-way radios?

zoom lens positions. Apprise the crew of the approximate moves and ranges of mobile cameras and what audio needs you have. Unless in a booth, specify where the announcers are going to be so that the monitors, mics, and intercom can be properly routed. Explain the major visualization points to the camera operators.

■ Be as decisive and precise as possible. Do not change your mind a hundred times before deciding on what you really want. There is simply no time for such deliberations on a remote.

■ While the technical crew is setting up, hold a production meeting with the contact person, producer, AD (assistant director), floor manager, PA, talent, and, if not directly involved in the setup, the TD (technical director) or technical supervisor. Have the contact describe the anticipated event. Explain how you intend to cover it. Although it is the producer's job to alert the talent to prominent features of the event, such as a prize-winning float in the parade, be prepared to take over in case the producer is sidetracked by some other problem. Delegate setup supervision to the AD, floor manager, and TD. Do not try to do everything yourself.

■ Pay attention to all communication systems, especially the intercom. During the telecast you will have no chance to run in and out of the remote truck to the actual site; all your instructions will come via voice communication from the truck. Discuss in detail the coverage of the event with the floor manager, who holds one of the most critical production positions during a remote.

■ Usually, you as a director have no control over the event itself; you merely try to observe it as faithfully as possible. If an announcer is to narrate and comment on the event, walk through the event site with him or her and explain as best you can what is probably going to happen. Once again, check with the contact person and announcer on the accuracy of the rundown sheet and the specific information concerning the event.

■ Check with the videotape operator on the tape length. Will it be sufficient to cover the whole event, or at least part of it, before a new tape is needed? When is the best time for a changeover to a second VTR?

■ Walk through the site again and visualize the event from the cameras' positions. Are they in the optimal shooting positions? Are they all on only one side of the principal vector so that you will not reverse the action on-screen when cutting from one to another? If shooting

outdoors, are any of the cameras going to be blinded by the sun? Where will the sun be at the end of the telecast? How do you intend to protect people and equipment in case of rain or snow?

■ Keep in mind that you are a guest while covering a remote event. Unless television is an integral part of the event, such as in most sports, try to work as quickly and as unobtrusively as possible. Do not make a big spectacle of your production. Realize that you are basically intruding on an event and that the people involved are usually under some stress. Although your first responsibility is to show the event as faithfully as possible, you must also make every effort not to add to the stress of the people involved. Keep a low profile to minimize the chances of someone performing for you simply to gain attention or, worse, of people staging a media event.

Directing the on-the-air telecast Once you are on the air and the event is unfolding, you cannot stop it because you have missed a major point. Keep on top of the event as well as possible. If you have a good spotter (the contact person and/or the AD), you will be able to anticipate certain happenings and be ready for them with the cameras. Here are some general points to remember:

■ Speak loudly and clearly. Usually, the site is noisy, and the camera operators and floor crew may not hear you very well. Put your headset mic close to your mouth. Yell if you have to, but do not get frantic. Tell the crew members to switch off their headset talkbacks to prevent the outside sound from entering the intercom system.

■ Listen to the floor manager and camera operators. They may help spot event details and report them to you as they occur.

■ Watch the monitors carefully; often the off-air cameras will get especially interesting shots. But do not be tempted by cute yet meaningless or even event-distorting shots. If, for example, the great majority of an audience listens attentively to the speaker, do not single out the one person who is sound asleep, as colorful a shot as this may be. Report the event as truthfully as you possibly can. If the event is dull, show it. If it is exciting, show it. Do not use production tricks to make it fit your expectations.

■ Listen to the audio. A good announcer will give you clues as to the development of the event and sometimes direct your attention to a significant event detail.

■ If things go wrong, keep calm. For example, if a spectator blocks the camera or if the camera operator swish-pans to another scene because he or she thinks the camera is off the air, cut to another camera instead of screaming at the floor manager or the camera operator for making a mistake.

■ Exercise propriety and good taste in what you show the audience. Avoid capitalizing on accidents (especially during sporting events) or situations that are potentially embarrassing to the person on-camera, even if such situations might appear hilarious to you and the crew at the moment.

Instant replay In an *instant replay*, a key play or other important event segment is repeated for the viewer. Instant-replay operations usually use iso cameras and recording devices (VTRs, hard disks, or read/write optical discs) that have unusually fast program search-and-retrieval speeds. Some large sports remotes employ a second, separate switcher that is dedicated exclusively to inserting instant replays. In very big remotes, the instant-replay and special-effects (including C.G.) operations are handled in a separate trailer.

During the replay, DVE (digital video effects) are often used to explain a particular play. The screen may be divided into several "squeezed" boxes or corner wipes, each displaying a different aspect of the play, or may function as an electronic blackboard that writes and does simple line drawings over the freeze-frame of an instant replay, very much like the sketches on a regular blackboard. Game and player statistics are displayed through the C.G. Some of the information is preprogrammed and stored on the computer disk. Up-to-date statistics are continuously entered by a highly skilled C.G. operator. The whole instant-replay and C.G. operation is normally guided by the producer or the AD. The director is generally much too occupied with the regular coverage to worry about the various replays and special effects. Also, the producer, who is free to follow the game, can become adept at spotting key plays and deciding which should be replayed; hence, he or she can pay full attention to the replay procedures.

When watching an instant replay of a key action, you may notice that the replay either duplicates exactly the sequence you have just seen or, more frequently, shows the action from a slightly different perspective. In the first case, the picture sequence of the regular game coverage—that is, the line output—has been recorded and played back; in the second case, the pickup of an iso camera has

been recorded and played back. In sports the principal function of the iso cameras is to follow key plays and other action for instant replay. Iso cameras are also used in a variety of studio and remote productions to shoot visual sequences that can later be used in postproduction editing. For example, when videotaping an orchestra performance with a multicamera setup, you may have an iso camera on the conductor at all times. This way you are covered with a logical cutaway during postproduction. In large productions, two or more iso cameras are used.

When a remote production is not live but done for postproduction, all cameras may be used in iso positions, with each camera's output recorded by a separate VTR or digital recording device. The output of all iso cameras is then used as source material for extensive postproduction editing.

Director's postshow activities The remote is not finished until all equipment is struck and the site is restored to its original condition. As a director of big remotes, you should pay particular attention to the following postshow procedures.

- If something went wrong, do not storm out of the remote truck, accusing everyone, except yourself, of making mistakes. Cool off first.
- Thank everyone for his or her efforts. Nobody ever wants a remote to look bad. Thank especially the contact person and others responsible for making the event and the remote telecast possible. Leave as good an impression of you and your team as possible with the persons responsible. Remember that you are representing your company and, in a way, the whole of the "media" when you are on remote location.
- Thank the police for their cooperation in reserving parking spaces for the remote vehicles, controlling the spectators, and so forth. Remember that you will need them again for your next remote telecast.
- See to it that the floor manager returns all the production equipment to the station.

Production: Floor Manager and Talent Procedures

Floor manager's procedures As a floor manager (also called stage manager or unit manager on big remotes), you have, next to the director and the TD, the major responsibility for the success of the remote telecast. Because you are close to the scene, you often have a better

overview of the event than does the director, who is isolated in the remote truck. The following points will help you make the big-remote production a successful one.

■ Familiarize yourself with the event ahead of time. Find out where it is taking place, how it will develop, and where the cameras and microphones are positioned relative to the remote truck. Make a sketch of the major event developments and the equipment setup (see section 20.2).

■ Triple-check all intercom systems. Find out whether you can hear the instructions from the remote truck and if you can be heard there. Check that the intercom is working properly for the other floor personnel. Check all L.F.B. channels, walkie-talkies, and any other field communication devices.

■ Be aware of the traffic in the production area. Try to keep onlookers away from the equipment and action areas. Be polite but firm. Work around the crews from other stations. Be especially aware of reporters from other media. It would not be the first time that a news photographer snapping pictures just happens to stand right in front of your key camera. Appeal to the photographer's sense of responsibility. Say that you, too, have a job to do in trying to inform the public.

■ If the telecast is to be videotaped, have the slate ready, unless the C.G. is used for slating.

■ Check that all cables are properly secured to minimize potential hazards to the people in the production area. If not done by the technical crew, tape the connectors of AC and intercom cables so that they will not pull apart.

■ Introduce yourself to the police officers assigned to the remote and fill them in on the major event details. The police are generally more cooperative and helpful when they feel that they are part of the remote operation.

■ Help the camera operators in spotting key event details and in moving their cameras and cables.

■ Relay all director's cues immediately and precisely. Position yourself so that the talent sees the cues without having to look for you. (Most of the time, announcers are hooked up to the L.F.B. via small earphones, so the director can cue them directly without the floor manager as an intermediary.)

■ Have several 3 × 5 cards handy so you can write cues and pass them on to the talent, just in case you lose the L.F.B. channel.

■ When talent is temporarily off the air, keep them informed about what is going on. Help keep their appearance intact for the next on-the-air performance and offer encouragement and positive suggestions.

■ After the telecast pick up all the production equipment for which you are directly responsible—cables, platforms, sandbags, slates, and headsets. Double-check whether you have forgotten anything before you leave the remote site. Make use of the director's or TD's equipment checklist.

Talent procedures The general talent procedures, as discussed in chapter 16, also apply to remote operations, but there are some points that are especially pertinent for you as talent:

■ Familiarize yourself thoroughly with the event and your specific assignment. Know the process message and do your part to effect it. Review the event with the producer, the director, and the contact person.

■ Test your microphone and your intercommunication system. If you work with an L.F.B. system, check it out with the director or the TD.

■ Verify that your monitor is working. Ask the floor manager to have the TD punch up the line-out picture as soon as the cameras are uncapped. Ask for at least color bars to be put on-line.

■ If you have the help of a contact person or a spotter, discuss again the major aspects of the event and the communication system between the two of you once on the air. For example, how is the spotter going to tell you what is going on while the microphone is hot?

■ When you're on the air, tell the audience what they cannot see for themselves. Do not report the obvious. For example, if you see the celebrity stepping out of the airplane and shaking hands with the people on the tarmac, do not say, "The celebrity is shaking hands with some people"; tell who is shaking hands with whom. If a football player lies on the field and cannot get up, do not tell the audience that the player apparently got hurt—they can see that for themselves; tell them who the player is and what might have caused what type of injury. Also, follow up this announcement periodically with more-detailed information on the injury and how the player is doing.

■ Do not get so involved in the event that you lose your objectivity. On the other hand, do not remain so detached

that you appear to have no feelings whatsoever.

- If you make a mistake in identifying someone or something, admit it and correct it as soon as possible.
- Do not identify event details solely by color, as colors are often distorted on home receivers. For instance, refer to the boxer not only as the one in the red trunks but also as the one on the left side of the screen.
- As much as possible, let the event itself do the talking. Keep quiet during extremely tense moments. For example, do not talk in the incredibly tense pause between the starter's "Get set" command and the firing of the starting pistol in the 100-meter track finals.¹

1. For a more detailed description of announcing a remote, see Stuart W. Hyde, *Television and Radio Announcing*, 8th ed. (Boston: Houghton Mifflin Co., 1998).

MAIN POINTS

- ◆ The three types of remotes are ENG (electronic news gathering), EFP (electronic field production), and big remotes.
- ◆ ENG is the most flexible remote operation. It offers speed in responding to an event, maximum mobility while on location, and flexibility in transmitting the event live or in recording it on portable videotape.
- ◆ Unlike ENG, which has little or no preparation time for covering a breaking story, EFP must be carefully planned. In this respect it is similar to big remotes. EFP is normally done with an event that can be interrupted and restaged for repeated videotaping. It is usually done with a single camera or iso cameras that shoot an event simultaneously.
- ◆ A big remote televises live, or records live-on-tape, a large, scheduled event that has not been staged specifically for television, such as a sports match, parade, political gathering, or congressional hearing.
- ◆ All big remotes use high-quality cameras in key positions and ENG/EFP cameras for more-mobile coverage. Big remotes usually require extensive audio setups.
- ◆ Big remotes are coordinated from the remote truck, which contains a program control center, an audio control center, a video-recording center, and a technical center that includes transmission equipment.
- ◆ Big remotes require extensive production and technical surveys as part of the preproduction activities.
- ◆ In sports remotes, instant replay is one of the more complicated production procedures. It is normally handled by an instant replay producer or an AD.

20.2

Covering Major Events

As you know by now, EFP and especially big remotes require meticulous preproduction work and planning. Such careful preparation is particularly important for onetime happenings, such as sporting events. No two remotes are exactly the same, and there are always special circumstances that require adjustments and compromises. This section includes some typical setups for sports remotes, how to "read" location sketches, and some examples of typical indoor and outdoor remote setups.

SPORTS REMOTES

Pickup requirements for baseball, football, soccer, basketball, tennis, boxing or wrestling, and swimming

LOCATION SKETCH AND REMOTE SETUPS

Reading location sketches, indoor remotes, and outdoor remotes

COMMUNICATION SYSTEMS

ENG, EFP, and big-remote communication systems

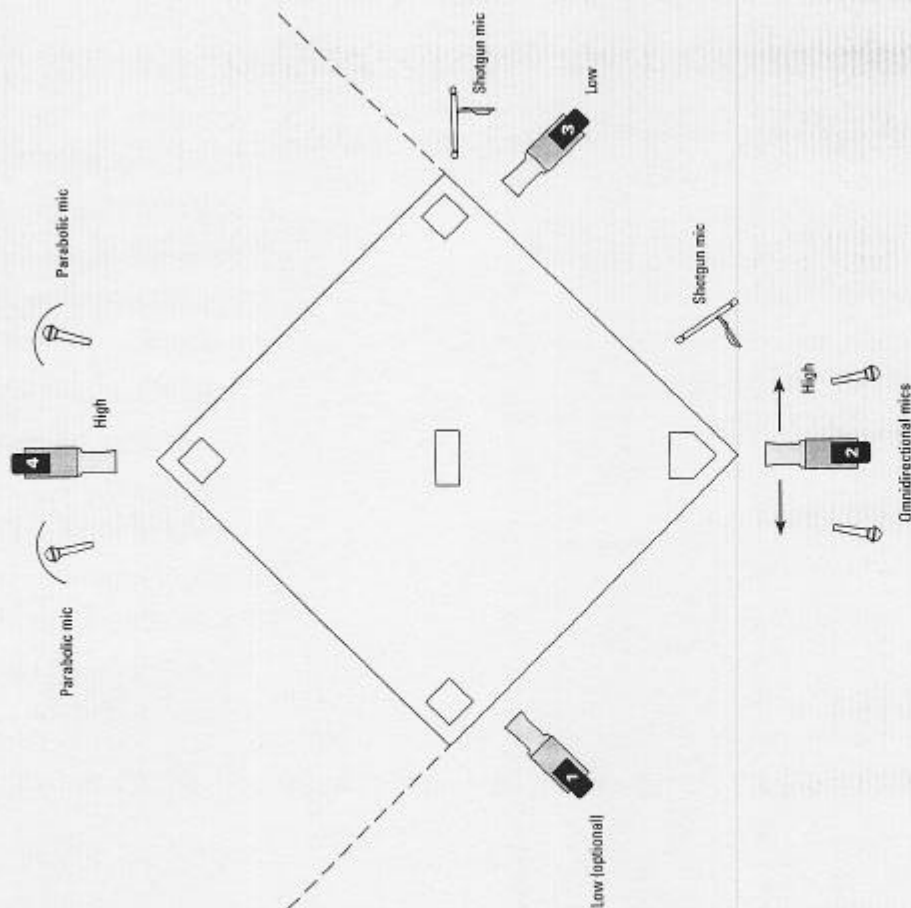
SIGNAL TRANSPORT

Microwave transmission; communication satellites—frequencies, uplinks, and downlinks; and cable distribution

SPORTS REMOTES

Many big remotes are devoted to the coverage of sporting events. The number of cameras used and their functions depend almost entirely on who is doing the remote. Networks use a great amount of equipment and personnel for the average sports remote. For especially important games, such as the Super Bowl or World Cup soccer, a crew of a hundred or so people set up and operate twenty or more cameras, countless mics, monitors, and intercom and signal-distribution systems. There are several large trailers that house the control room and production equipment. For the coverage of a local high-school game, however, you must get by with far less equipment. Local stations or smaller production companies usually supply only the key production and technical personnel (producer, director, associate director, PA, floor manager, TD, and audio) and hire a remote service that includes a remote truck, all equipment, and extra personnel, if necessary.

The following figures illustrate the minimum video and audio pickup requirements for baseball, football, soccer, basketball, tennis, boxing or wrestling, and swimming. **SEE 20.7-20.13** Sometimes small ENG/EFP cameras are used in place of the larger high-quality



20.7 BASEBALL SETUP

Number of cameras: 3 or 4

C1: Near third base; low, optional

C2: Behind home plate; high

C3: Near first base; low; watch for action reversal when intercutting with C1

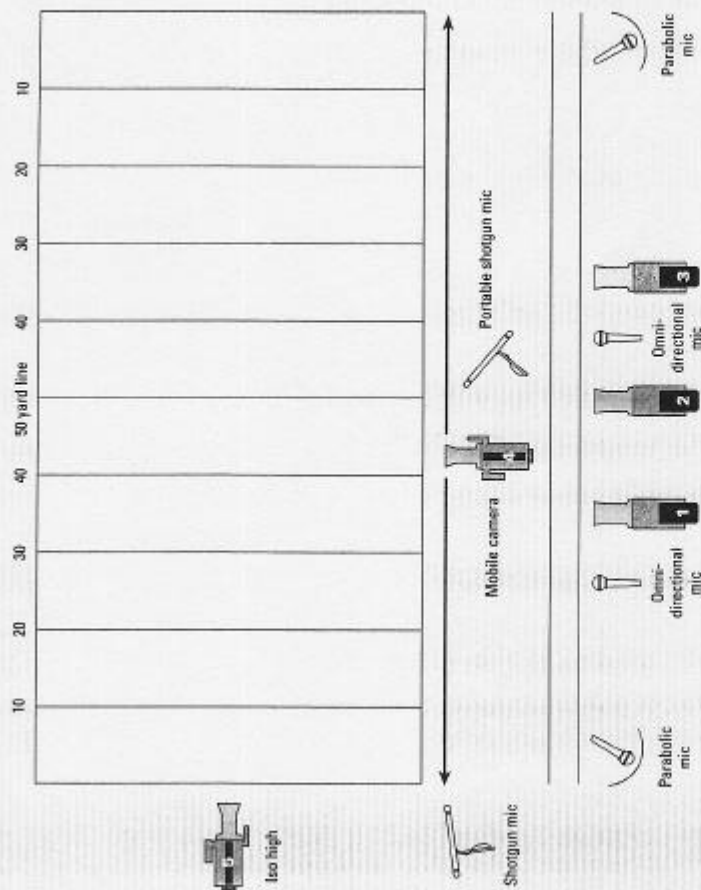
C4: opposite C2 center field; high; watch for action reversal

Number of mics: 5 or 6

2 omnidirectional mics for audience high in stands

2 shotgun mics behind home plate for game sounds

1 or 2 parabolic mics for field and audience sounds



20.8 FOOTBALL SETUP

Number of cameras: 4 or 5

C1, C2, C3: High in the stands, near the 35-50-35 yard lines

(press box, shadow side)

C4: Portable or on dolly in field

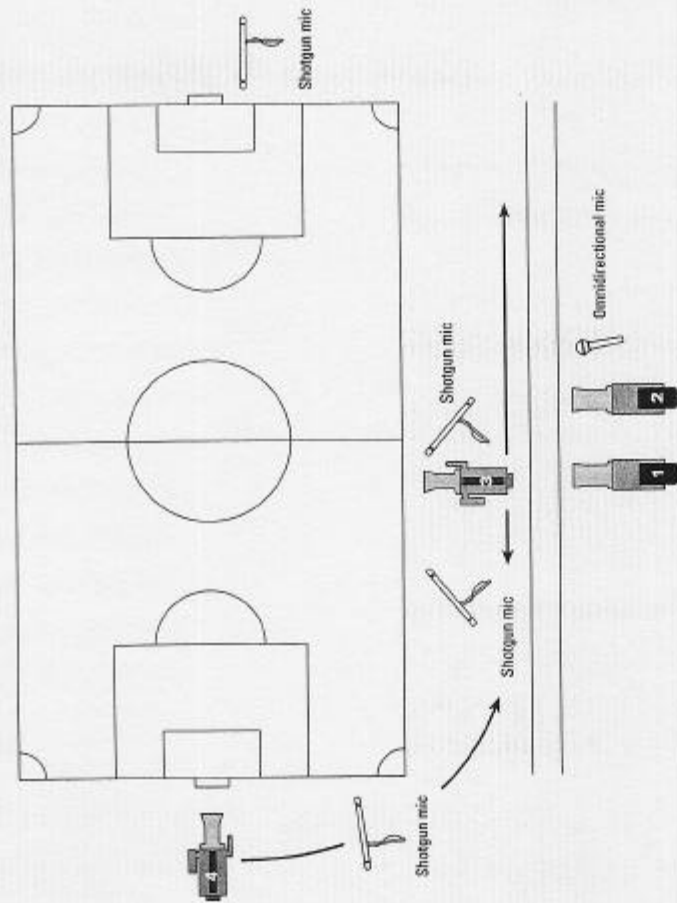
C5: Optional iso camera behind goal (portable ENG/EFP or big camera)

Number of mics: 6

2 omnidirectional mics for audience (in stands)

2 shotgun or parabolic (mobile) mics on field

2 parabolic reflector mics in stands



20.9 SOCCER SETUP

Number of cameras: 3 or 4

C1: Left of center line (high)

C2: Right of center line (high)

C3: Mobile on field

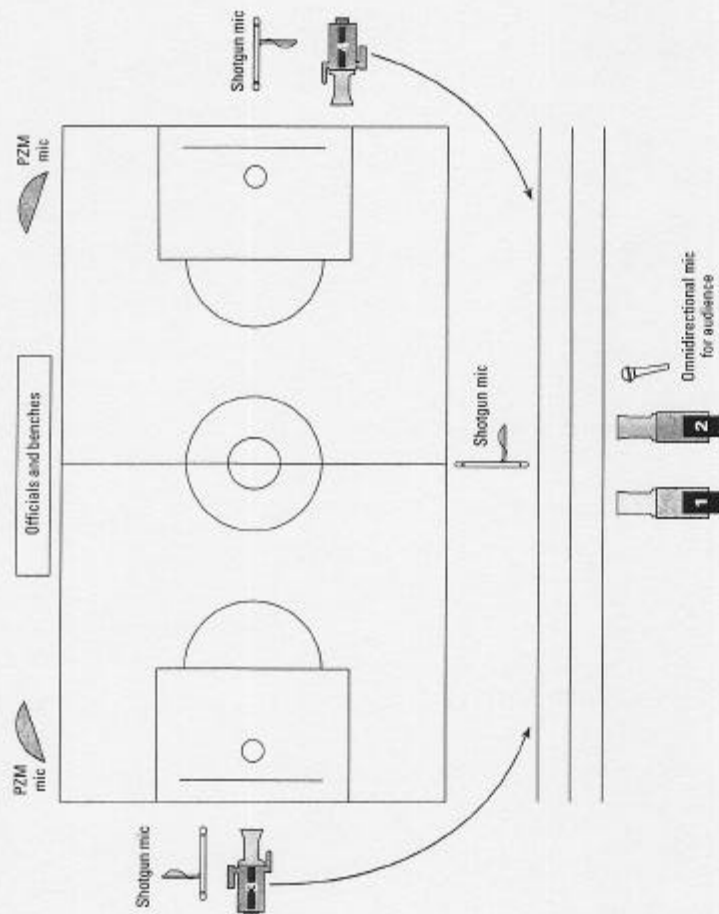
C4: Optional, behind goal; may be used as iso camera and mobile camera on field

All three major cameras are on shadow side of field

Number of mics: 5

1 omnidirectional mic in stands for audience

4 shotgun or parabolic mics on field



20.10 BASKETBALL SETUP

Number of cameras: 4

C1: High in stands, left of centerline

C2: High in stands, right of centerline (fairly close to C1)

C3, C4: Behind baskets (mobile)

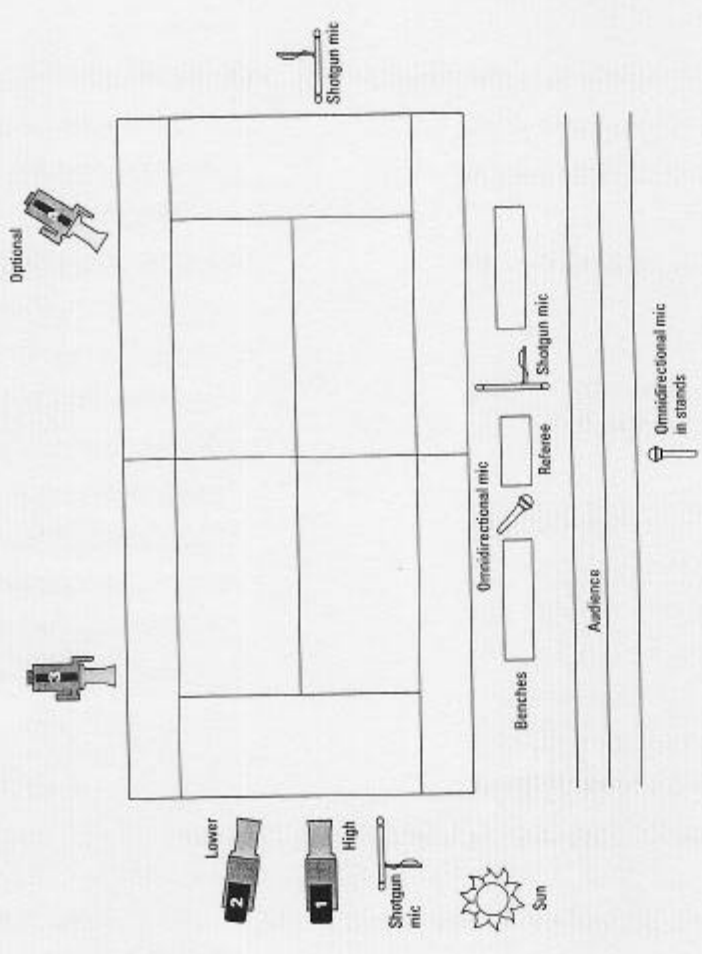
Number of mics: 6

1 omnidirectional mic in stands for audience

2 P2M mics in stands for audience

2 shotgun mics behind each basket for game sounds

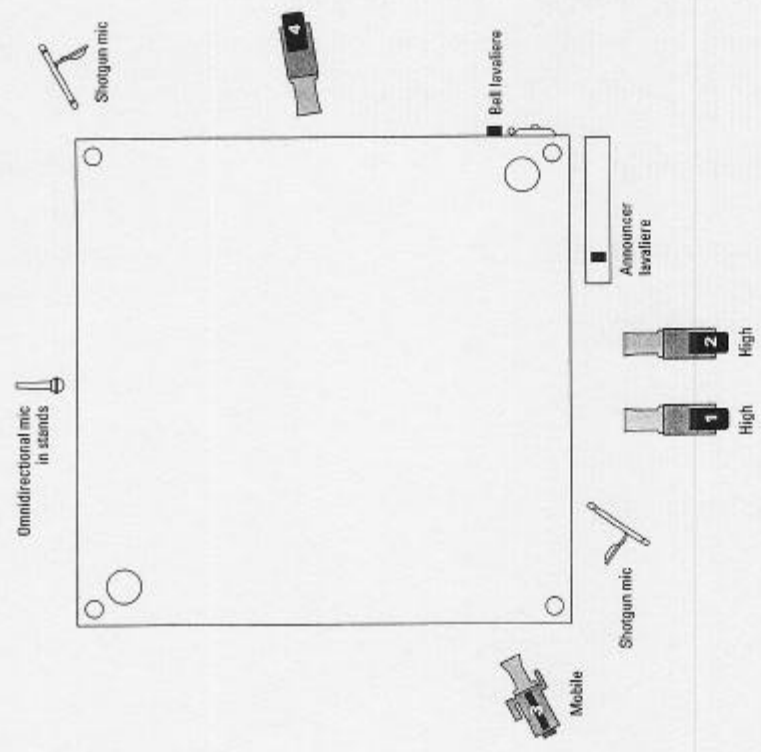
1 shotgun mic at center court



20.11 TENNIS SETUP

Number of cameras: 3 or 4
C1: At end of court, high enough so that it can cover total court, shooting with sun
C2: Next to C1, but lower
C3: At side of court, opposite officials or where players rest between sets (mobile); also shoots CUs of left player
C4: CUs of right player

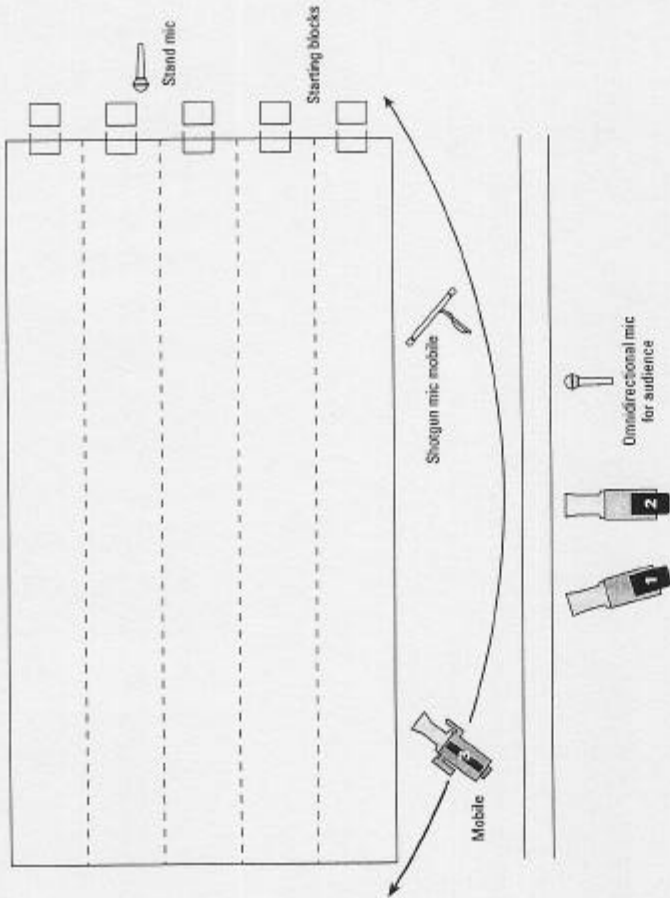
Number of mics: 5
1 omni-directional mic in stands for audience
1 omni-directional mic for referee's calls
3 shotgun mics for pickup of game sounds (center court and on each end of court)



20.12 BOXING OR WRESTLING SETUP

Number of cameras: 3 or 4
C1: High enough to overlook the entire ring
C2: About 10 feet to the side of C1; high, slightly above ropes; used for replays
C3: ENG/EFP mobile camera carried on floor, looking through the ropes
C4: ENG (see above)

Number of mics: 5
1 omni-directional mic for audience
2 shotgun mics for boxing sounds and referee
1 lavalier for bell
1 lavalier for announcer



20.13 SWIMMING SETUP

- Number of cameras: 2 or 3
 C1: High in stands, about at center of pool
 C2: Next to C1
 C3: Optional ENG/EFP mobile camera on side and ends of pool

studio/field cameras or are added to the minimal setups described here.

LOCATION SKETCH AND REMOTE SETUPS

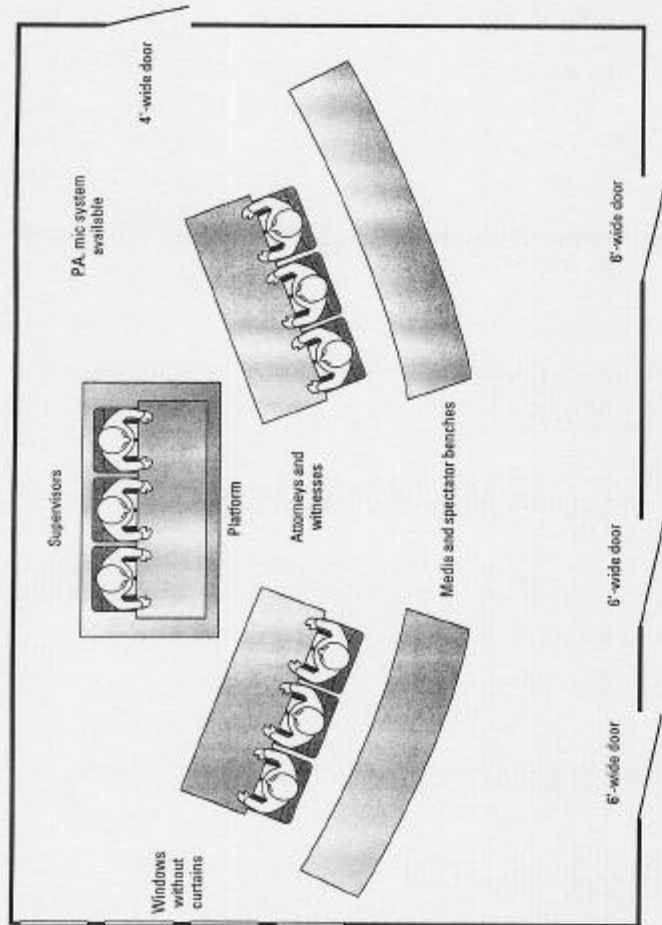
To simplify preproduction you as the director, or your AD, should prepare a location sketch. Like the studio floor plan, the *location sketch* shows the principal features of the environment in which the event takes place (stadium and playing field, street and major buildings, hallways, rooms). This location sketch will

- Number of mics: 3
 1 omnidirectional mic in stands for audience
 1 shotgun mic at pool level for swimmers
 1 omnidirectional mic on stand

help you decide on the placement of cameras and microphones, the TD on the location of the remote truck and cable runs, and, if indoors, the LD on the type and placement of lighting instruments.

Reading Location Sketches

As you recall from section 20.1, the location sketch for indoor events should indicate the general dimensions of the room or hallway; the location of windows, doors, and furniture; and the principal action (where people are seated or where they will be walking). It would help if the sketch also contained such details as power outlets; actual



20.14 LOCATION SKETCH OF CITY HALL HEARING ROOM

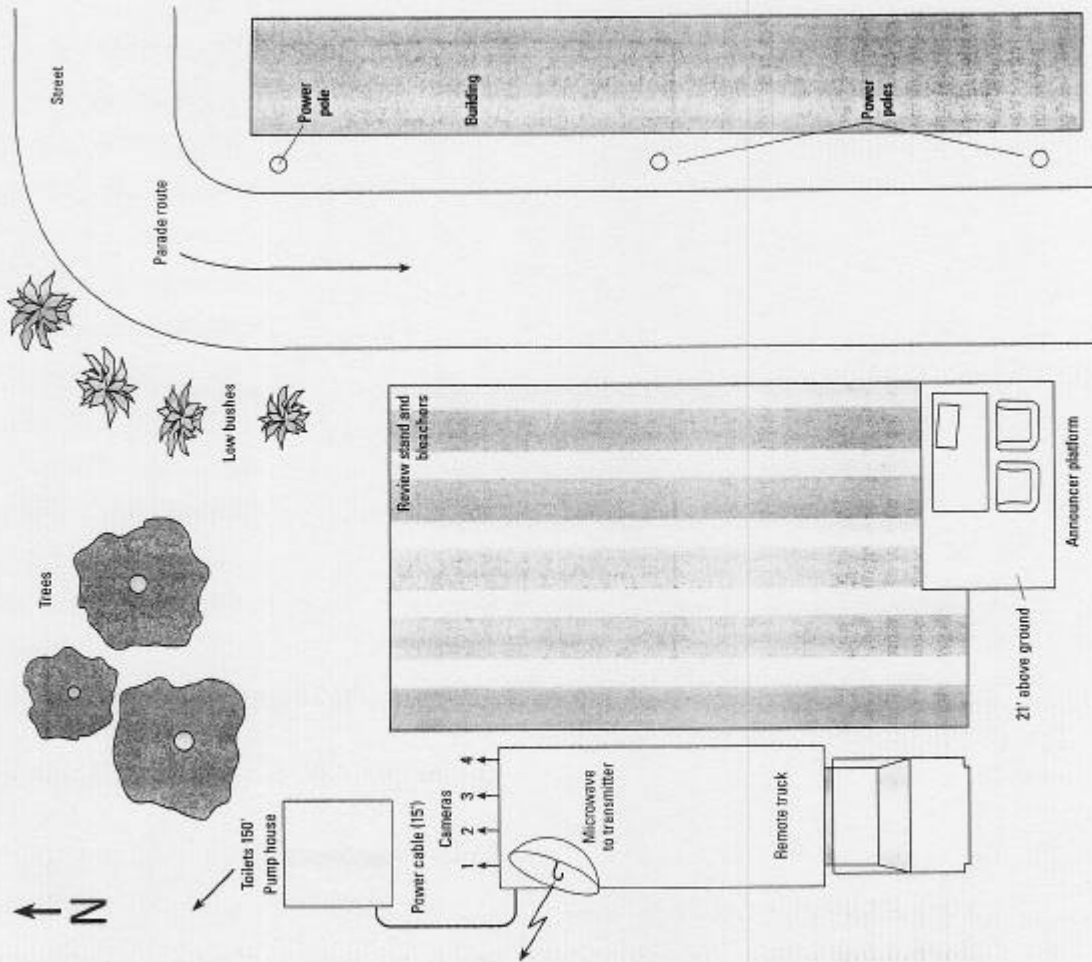
width of especially narrow hallways, doors, and stairs; direction the doors open; and prominent thresholds, rugs, and other items that may present problems for the movement of cameras mounted on tripod dollies.

The sketch of an outdoor remote should indicate the location of buildings, remote truck, major power source if any, steps, steep inclines, fences, and the sun travel during the time of the remote.

Before continuing, try to "read" the indoor location sketch (see figure 20.14) and the outdoor location sketch (see figure 20.15) and list as many production requirements as you can determine from the sketches. Then pencil in the type and placement of cameras and microphones. Once done, compare your lists and equipment placement with figures 20.16 and 20.17 and the following production requirements sections.

Public hearing The occasion is an important public hearing at city hall. **SEE 20.14** Assuming that you are the director of the remote, what can you tell from this sketch? How much preparation can you do? What key questions does the sketch generate? Limiting the questions to the setup within this hearing room, what are the camera, lighting, audio, and intercom requirements?

Parade The outdoor remote is intended for a Sunday afternoon live multicamera telecast. The estimated time of the telecast is from 3:30 to 5:30 p.m. The location sketch in figure 20.15 shows the action area as well as the major facilities. What important setup and production clues can you devise from this location sketch? **SEE 20.15**



20.15 LOCATION SKETCH OF PARADE

Now compare your list and sketch for the city hall hearing room with the setup shown in figure 20.16.

Production Requirements for Public Hearing (Indoor Remote)

■ **Cameras** Two ENG/EFP cameras on tripod dollies connected by cable to the remote truck. C1 will cover the supervisors; C2 will cover the attorneys, witnesses, and spectators.

■ **Lighting** The hearing is scheduled for 10 A.M. The large window presents a definite lighting problem. Cover with drapes. Additional floodlighting is needed to bring up the baselight. If the room is high enough, place some back lights. Are there enough AC outlets for the lights? Are they on different circuits? There may be some access problem, if the mic and lighting cables are strung past the doors.

■ **Audio** Because the hearing room is already equipped with a P.A. system, tie into the existing mics. If the system is not operational, desk mics are the most logical solution. One additional mic should be placed on each of the three tables (supervisor and two witness tables) just in case the existing audio system stops working.

■ **Intercommunications** Because there is little or no cutting involved (usually for the start and end of the taping only), the floor manager can plug the headsets into one of the cameras. If ENG/EFP cameras are used, separate intercom cables may have to be strung for the floor manager and each camera operator.

■ **Other considerations** Camera cables can be routed through the side door. If the room has a hardwood floor, the cameras could dolly into various positions for optimal shots. Because there is much traffic in the room, all cables must be taped to the floor and covered by rubber mats. Camera 1 will be in heavy traffic because of the public access doors. **SEE 20.16**

Now compare your list and sketch for the parade with the setup as shown in the next figure. **SEE 20.17**

Production Requirements for Parade (Outdoor Remote)

■ **Location of remote truck** Good location. Truck is fairly close to a power source (pump house) and the camera positions, minimizing cable runs.

■ **Cameras** Minimum of four cameras: C1 and C2 (studio/field cameras) on top of the bleachers; C3 and C4 (ENG/EFP) on the street. C2 can also cover talent.

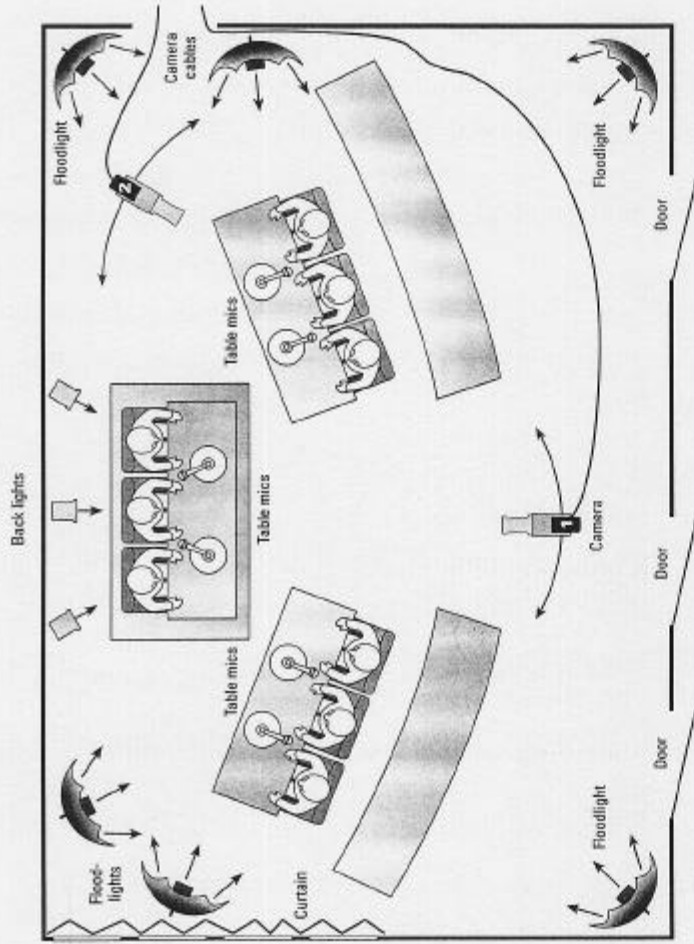
■ **Lighting** Because the videotaping is scheduled for 3:30 to 5:30 P.M., there is sufficient light throughout the telecast. The sun is mostly in back of the cameras throughout the telecast.

■ **Audio** There are three types of audio pickup: (1) the voice pickup of the two announcers, (2) the bands in the parade, and (3) the sounds of the spectators. Lavalier mics with windcreens for talent. Two shotgun mics (one high in the stands, the other just above ground level) for the bands. One omnidirectional mic near the announcer platform for the crowd noise. All mics need windcreens.

■ **Intercommunications** The camera operators are connected to the normal PL lines of the camera cables. Separate intercom line for the floor manager's headset. I.F.B. for the talent. At least two telephone lines for intercommunication come from the truck: a direct line to station and transmitter and another line for general voice communication.

■ **Signal transmission** Direct microwave link to the transmission tower (and from there to the station). Audio is sent via telephone lines (independent of microwave). This separation ensures audio continuity even if the microwave link fails.

■ **Other considerations** Cameras 1 and 2 need a field lens to catch close-ups of the action around the bend (40x). Can camera 2 be pedestaled high enough so that it will not be blocked by people standing up in the bleachers? Large monitor for talent. Second monitor for backup. Shade monitor from sun. Route cables underneath the platform to reduce potential hazard for people.



20.16 HEARING ROOM WITH FACILITIES

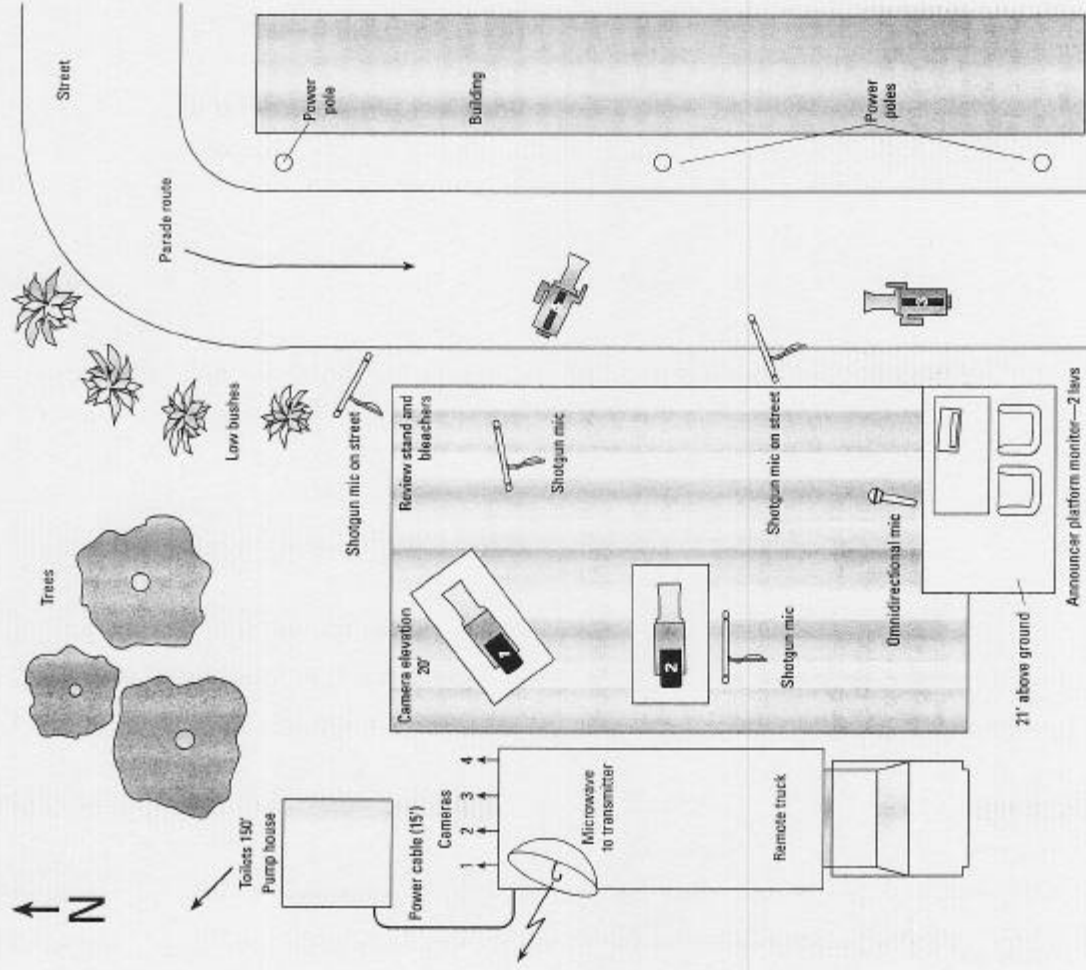
The ENG/EFP cameras (3 and 4) need cable pullers in addition to the camera operators. Toilet facilities are fairly close to the pump house. Raincoats and umbrellas may be needed for crew, talent, and cameras just in case the weather report predicting a beautiful day is wrong.

COMMUNICATION SYSTEMS

Well-functioning communication systems are especially important for production people in the field, regardless of whether the "field" is the street corner across from the station or one in London. These systems must be highly reliable and must enable the people at home base to talk with the field personnel, and the field

personnel to talk with one another. When doing ENG you must be able to receive messages from the news department as well as the police and fire departments. As a producer or director, you need to reach the talent directly with specific information even while the talent is on the air.

We have come to expect the relatively flawless transporting of television pictures and sound, regardless of whether they originate from the mayor's downtown office or the moon. Although communication systems and signal distribution are the province of the technical crew, you should still have some idea about them so that you will know what you can ask for. This section provides a brief overview of ENG, EFP, and big-remote communication systems.



20.17 LOCATION SETUP FOR PARADE

ENG Communication Systems

ENG Electronic news gathering has such a high degree of readiness not only because of the mobile and self-contained camera/VTR/audio unit but also because of elaborate communication devices. Most ENG vehicles are equipped with cellular phones, scanners that continuously monitor the frequencies used by police and fire departments, a paging system, and two-way radios. Scanners lock in on a certain frequency as soon as they detect a signal and let you hear the conversation on that frequency.

These communication systems also make it possible for your station's news department to contact you while you are traveling to or from an assignment and give you a chance to respond immediately to police and fire calls. Sometimes news departments use codes to communicate with their "cruising" field reporters to prevent the competition from getting clues to a breaking story.

EFP Communication Systems

ENG A single-camera EFP needs the least sophisticated communication system. Because the director is in direct contact with the crew and talent at the shoot location, no intercom systems are needed. Generally, widely dispersed crew members keep in touch with one another by using walkie-talkies. As pointed out earlier, a small power megaphone might save your voice when giving directions to talent and crew.

The EFP van is normally equipped with phone jacks for regular phone connections and several cellular phones. If the EFP uses multiple cameras that are coordinated from a central location, a regular headset intercom system must be set up for the communication between director, TD, and crew. When doing a live telecast from the field, an I.F.B. system is added.

Big-Remote Communication Systems

ENG Big remotes need communication systems between the truck (or any other remote control room) and the production people, between the truck and the station, and between the truck and the talent. The truck and the production crew communicate through a regular PL (private line or phone line) system, which uses the PL channels in the camera cable, separately wired PL lines, or wireless PLs. During a complicated setup in which the crew is widely scattered (such as a downhill ski race),

walkie-talkies are also used. If necessary, the PL communication can be carried by telephone lines from truck to station.

The I.F.B. (interruptible foldback or feedback) is one of the most important communication systems between the producer or director and the talent during a big remote. When using the I.F.B. system, the talent wears a small earphone and hears the total program sound, including his or her own voice, as foldback from the truck. This program foldback can be interrupted at any time by the director or producer to give specific instructions to the talent. If several reporters or commentators are involved in the same event, you can switch among several I.F.B. channels so that, if necessary, you can address the various field reporters and commentators individually. If needed, your I.F.B. instructions to the talent can be transmitted via satellite over great distances. Realize, however, that there is inevitably a slight delay before the talent receives your instructions.

The remote truck is, of course, equipped with several wired telephone lines, two-way radios, cellular phones, paging systems, and walkie-talkies.

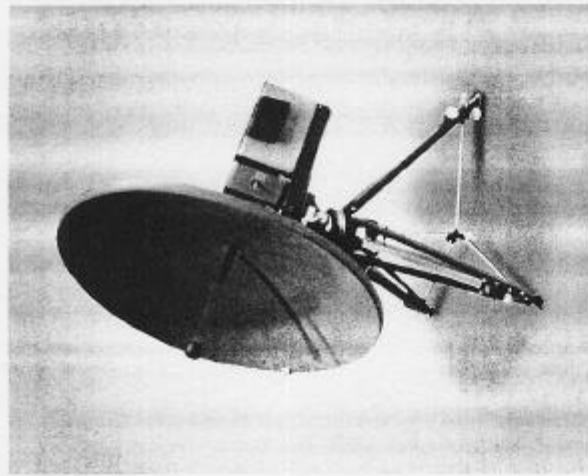
SIGNAL TRANSPORT

Signal transport refers to the various systems available to you when transmitting the video and audio signals from their origin (microphone and camera) to the VTRs or transmitter, and from one point (point of origin) to many others (reception points). Signal transport includes (1) microwave transmission, (2) communication satellites, and (3) cable systems.

Microwave Transmission

If you need to maintain optimal camera mobility during a live pickup, such as shooting interviews from a convention floor, you cannot use a camera cable but must microwave the signal back to the production vehicle ("remote van").

From camera to remote van There are small, portable, battery-powered transmitters that can be mounted on the camera. If the distance from camera to receiving station is not too great, you can relay the camera video and audio signals to the remote van without too much difficulty. To minimize interference by other

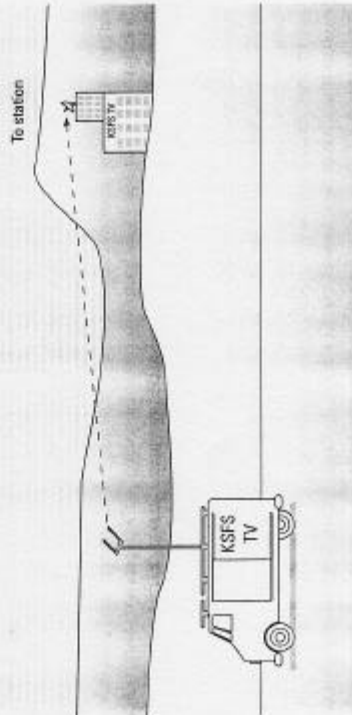


20.18 TRIPOD-MOUNTED MICROWAVE TRANSMITTER

This small tripod-mounted microwave transmitter can relay camera signals over a considerable distance.

20.19 DIRECT MICROWAVE LINK

You can transmit the signal via microwave from the remote van back to the station only if there is a clear, unobstructed line of sight.



stations covering the same event, you can transmit on several frequencies, called *frequency agility*.

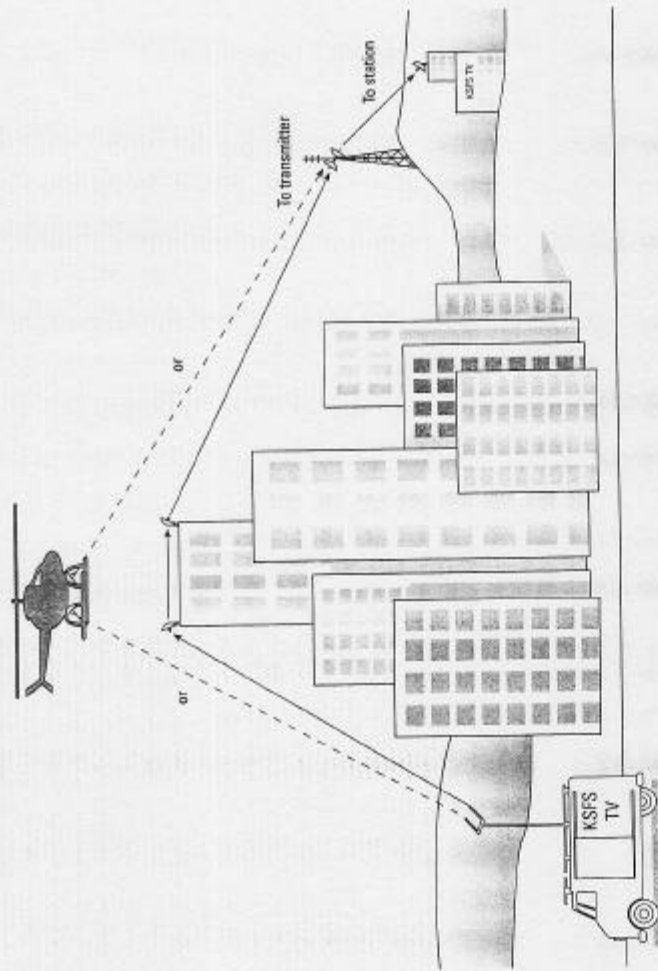
If you need a more powerful microwave transmitter, you can mount it on a tripod and place it close to the camera action radius. Thus you can work a considerable distance away from the remote van while using only a relatively short cable run from camera to microwave transmitter. This type of link is especially useful if a cable run would create potential hazards, such as a camera cable strung from a building across high-tension wires. **SEE 20.18**

The main problem with camera-to-van microwave links is interference, especially if several television crews are covering the same event. Even if you use a system with relatively great frequency agility, your competition may be similarly agile and overpower you with a stronger signal.

From remote van to station or transmitter

The longer, and usually much more complex, signal link is from the remote van to the station. (Although sometimes the signal is sent directly to the transmitter, we will call the end point of this last link before the actual broadcast the "station.") You can send the signals from the remote van directly to the station only if you have a clear, unobstructed line of sight. **SEE 20.19**

Because the microwave signal travels in a straight line, tall buildings, bridges, or mountains that are in the



20.20 MINI-LINK FROM REMOTE VAN TO STATION

If there is no clear line of sight between the remote location and the station, the microwave signal must be transported via transmission links.

line of sight between remote van and station may block the signal transmission. In such cases, several microwave links, called *mini-links*, have to be established to carry the signal around these obstacles. **SEE 20.20**

In metropolitan areas the various television stations have permanent *microwave relays* installed in strategic locations so that remote vans can send their signals back from practically any point of their coverage area. If these permanent installations do not suffice, helicopters are used as microwave relay stations. Such microwave relays are also used for transmitting the video of permanently installed cameras that monitor the weather and/or traffic.

Communication Satellites: Frequencies, Uplinks, and Downlinks

The communication satellites used for broadcast are positioned in a geosynchronous orbit 22,300 miles above the earth. In this orbit the satellite moves synchronously with the earth, thereby remaining in the same position relative to it.

Satellite frequencies Communication satellites operate on two frequency bands—the lower-frequency *C-band* and the higher-frequency *Ku-band* ("kay-you-

band"). Some satellites have transponders for C-band as well as Ku-band transmission and can convert internally from one to the other. A *direct broadcast satellite (DBS)* has a relatively high-powered transponder (transmitter/receiver) that broadcasts from the satellite to small individual downlink dishes you can buy in larger electronic stores and install yourself. DBS operate on the Ku-band.

The C-band is a highly reliable system that is relatively immune to weather interference. Because the C-band works with microwave frequencies, it may interfere with ground-based microwave transmission. To avoid such interference, the C-band operates with relatively low power; because of the low power, the ground stations need large dishes, which range anywhere from 15 to 30 feet. Such large dishes are obviously not suitable for mobile uplink trucks. To use the C-band, the television signals must be transported to and from permanent ground stations.

The C-band requires careful scheduling. It is usually crowded with regular transmissions, such as daily network or cable programming. The other problem is that even if some C-band transponders (in the satellite) are available, the uplinks and downlinks may be busy with signal transmission, so you cannot access the transponders.

The *Ku-band*, on the other hand, operates with more power and smaller dishes (2 feet or less) that can be mounted and readily operated on mobile trucks or your home. The Ku-band is also less crowded than the C-band and allows immediate, virtually unscheduled access to various uplinks. One of the major problems with the Ku-band is that it is susceptible to weather: rain and snow can seriously interfere with transmission. Another problem is that the Ku-band is about twice as expensive as the C-band.

Uplinks and downlinks The television signals are sent to the satellite through an *uplink* (earth station transmitter), received, amplified by the satellite, and beamed back in a different frequency (actually rebroadcast) by the satellite's own transmitter to one or several receiving earth stations, called *downlinks*. The receiver-transmitter unit in the satellite is called a *transponder*, a combination of *transmitter* and *responder* (receiver). Many satellites used for international television transmission have built-in translators that convert one electronic signal standard, such as our NTSC system, automatically into another, such as the European PAL system.

Because the satellite transmission covers a large area, simple receiving stations (downlinks) can be set up in many widely dispersed parts of the world. **SEE 20.21** In fact, these strategically placed satellites can spread their *footprint* (coverage area) over the whole earth.

Specialized vans can provide mobile uplinks for the transport of television signals. These *uplink trucks* operate on the very same principle as a microwave van, except that they send the television signals to a satellite rather than to a receiving microwave dish. As noted in section 20.1, *SMV's (satellite news vehicles)* usually contain additional equipment, such as several videotape recorders and editing equipment.

Cable Distribution

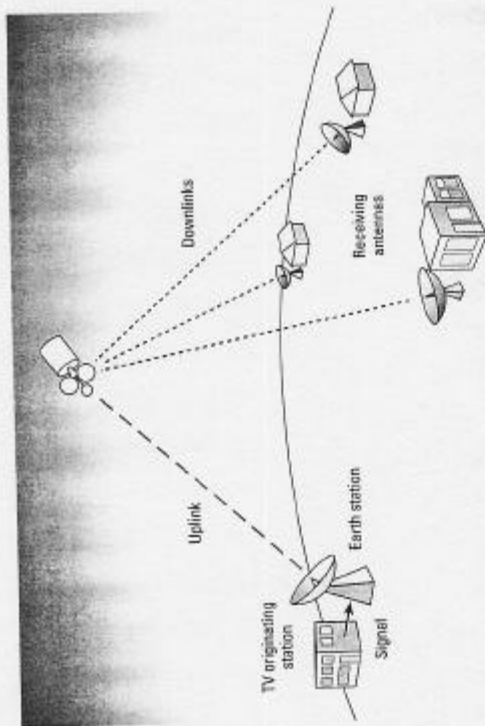
As you know, television audio and video signals are also distributed via coax (coaxial) or fiber-optic cable. The *coax cable* transports the video and audio information on an electromagnetic carrier wave at a relatively low radio frequency.

A *fiber-optic cable* consists of a great number of fiber-optic strands, each of which is thinner than a human hair and capable of carrying a great amount of information. When using fiber-optic cables for signal transport, the electrical (video and audio) signals are encoded at the point of origin into bursts of light that are decoded again into electrical signals at the destination. When you bundle many of these strands together into a fiber-optic cable of only half the thickness of a normal coax cable, you have a transmission device with an ultimately higher transmission capacity. Besides the obvious advantages of light weight and high information capacity, fiber-optic cables are relatively immune to moisture and electrical interference and can transport the signal over several miles without reamplification.

Both types of cable are used extensively for the transport of television signals to television stations and remotes. They are also used as a nonbroadcast home-delivery system of television signals by cable and telephone companies. The typical signal transport and distribution system by cable companies consists of a *head end* (origination point) that receives the signal from satellites or television transmitters. From there, the signals are amplified and distributed along a *trunk line* to many feeder lines. The *feeder lines* bring the signals to various locations, such as city streets or blocks. Finally, *drop lines* bring the signals to individual homes. **SEE 20.22**

20.21 SATELLITE UPLINK AND DOWNLINKS

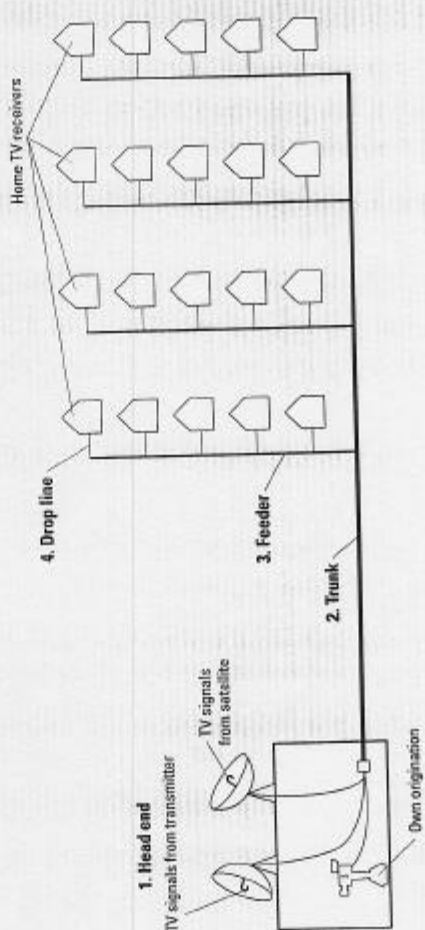
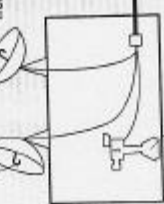
The uplink sends television signals to the satellite. The downlinks receive television signals from the satellite.



1. Head end

TV signals from transmitter

TV signals from satellite



20.22 CABLE TELEVISION SYSTEM

The cable distribution system consists of: (1) the head end, where the signals are collected or originated; (2) the trunk, through which the signals are sent to the feeders; (3) the feeders, which bring the signals to various localities (city streets, blocks); and (4) drop lines, which connect the feeders to individual homes.

MAIN POINTS

- Many big remotes are devoted to the coverage of sporting events. Networks typically use a great amount of equipment and personnel for sports remotes, but good coverage is also possible with less equipment.
- There are standard setups for most sporting events, which can be augmented with more cameras and audio equipment.
- Location sketches are a valuable reproduction aid for big remotes. For an indoor remote, they may show the general dimensions of a room or hallway; the locations of windows, doors, and furniture; and the principal action areas. Outdoor location sketches may show buildings, remote truck location, power source, steep inclines or steps, the path of the sun, and the location and/or direction of the main event.
- A good location sketch can aid the director in deciding on major camera locations, focal lengths of zoom lenses, lighting and audio setups, and intercommunication systems.
- Remote operations depend heavily on reliable intercommunication systems, including the P.L. system, walkie-talkies, pagers, cellular phones, and multichannel L.F.B. systems. The L.F.B. information can be transmitted via satellite to widely scattered talent in remote locations.
- The remote signals are usually transported via microwave, satellite, or cable.
- The communication satellites used for broadcast operate in the lower-frequency C-band and the higher-frequency Ku-band.

ZETTL'S VIDEO LAB 2.1

There are some definite advantages to taking a production out of the studio and into the field. You can place or observe an event in its real setting, or select a specific setting for a fictional event, and you have an infinite variety of settings to choose from. The **process** module of Zettl's VideoLab 2.1 gives you some insight into these and other advantages of field productions.

RUN ZVL 1



Click on the **process** monitor and run tape 6 **Methods**. Click on the **Location** module. You will hear about some of the advantages of doing field productions.

RUN ZVL 2



Click on the **Single-camera** and **Multicamera** modules. Both describe the relative advantages of each method.