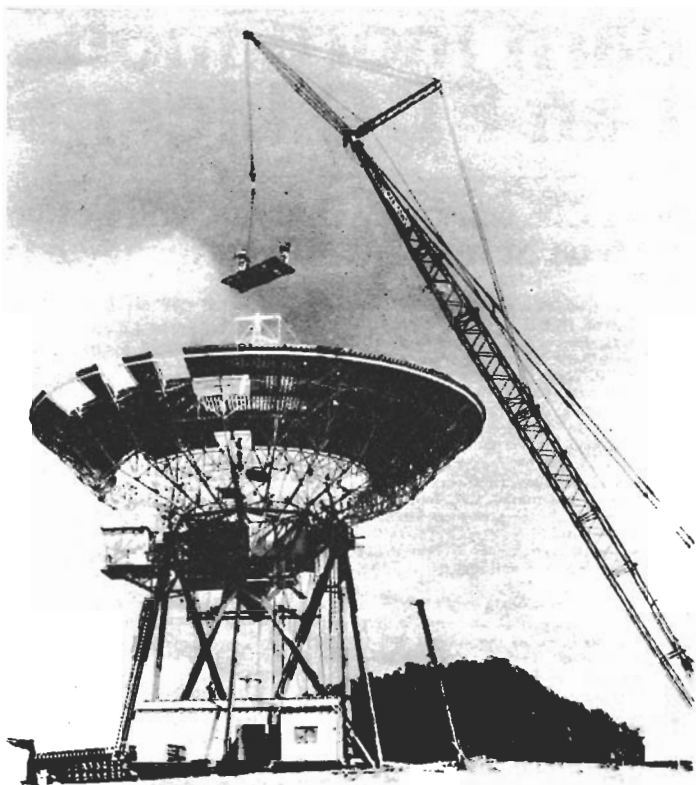


DXing NASA and its Neighbors

Listening to NASA broadcasts isn't easy—fact is, it's almost impossible—but you can DX radio stations that are neighbors of NASA affiliates and which are located all over the globe. Our DX expert tells how.



By **ALEX BOWER** YES, things are coming down to the wire. Apollo XVI is scheduled to blast off as this is being written and Apollo XVII—the last of the series—is scheduled for a December launch. For quite some time DXers have wanted to log the exciting conversations that take place between Houston and Cape Kennedy, between Ground Control and the spacecraft, between Command Module and Lunar Module.

Only trouble is, most of us don't have the fancy equipment that goes along with these transmissions. As you can see from NASA's frequencies, few involve voice communications—most being advanced forms of telemetry that make use of pulse-code, frequency and phase modulation techniques.

What rag-chewing there is takes place up at rarefied frequencies lying between 200 and 300 mc. Other more-informal talk sessions enjoy a bigger spread—some taking place near the FM broadcast band, others popping a cork up in the microwave region around 2000 mc.

So what's an average DXer to do? Well,

don't walk away. Aside from the ultra-sophisticated DXer who works 2 meters via moonbounce or engages in other RF gymnastics at even higher frequencies (who manages to listen in on these private transmissions, but rarely gets QSLs) there is still some DX activity left for those SWLs who work the standard bands.

While Cape Kennedy now only contacts space vehicles directly when they're orbiting the Earth—all deep-space contacts are handled by five communications facilities scattered around the world that work super DX on frequencies such as 2106.4 and 2101.8 mc—the Cape still maintains shortwave communications for such chores as recovery of the space capsule. DXers have a good chance of logging these messages on frequencies such as 17979, 11205 and 9006 kc, especially during launch and splash-down. These transmissions are all via single sideband.

Other NASA IDs which can be bagged on these same frequencies include the islands of San Salvador, Grand Bahama, Ascension and Lajas (Canary Islands). Your reports should be addressed to the technician in charge.

Guide to DXing NASA's Neighbors			
Freq. (kc)	Station	Location	Time
590	KFXM	San Bernardino	0400
683	R. Nacional de Espana	Madrid	evenings
730	5CL	Adelaide, Australia	0500
860	WKKO	Cocoa, Fla.	sunrise/sunset
6090	VLI6	Sydney, Australia	before sunrise
6140	R. Nacional de Espana	Madrid	evenings
9006	Cape Kennedy And Atlantic Recovery Net		(see text)
9360	R. Nacional de Espana	Madrid	evenings
9560	Radio RSA	Johannesburg, S. Africa	evenings
9695	Radio RSA	Johannesburg	evenings
11205	Cape Kennedy And Atlantic Recovery Net		(see text)
17979	Cape Kennedy And Atlantic Recovery Net		(see text)

Chart above shows stations that are close to NASA communications facilities and which count as valid contacts. Chart at right lists many of the frequencies which will be used on final Apollo missions. Most are for data transmission and radar tracking. The contents are private and not to be divulged.

Radio Unit — (ID of station), Patrick Air Force Base, Fla.

Remember that technicians who verify a report are doing it for their own amusement and for the sake of the hobby. NASA officials do not recognize such reports—they feel that their messages are private communications whose revelation can only confuse the public about the nature of a specific mission—and it's practically impossible to get a formal reply from the space agency.

Since Cape Kennedy is probably too close to home for any technician who wants to verify even the simplest DX report, you'll be better off shooting for one of the BCB stations in the area of Cocoa Beach. Not easy logging, to be sure, but WKKO on 860 kc might be possible at either sunrise or sunset (Florida time). A lot will depend on your local QRM.

The major deep-space communications facility in the U.S. is at Goldstone Lake, Calif., located between Death Valley and the Mojave Desert on the Camp Irwin Military Reservation. Shortwave facilities are nil so you'll have to settle for more mundane stations located in San Bernardino County. Sta-

Guide to Spaceflight Frequencies for Apollo Missions			
Freq. (mc)	Mode	Power	Function
232.9	FM TEL	20 W	Launch Vehicle, XVII
234.0	FM TEL	20 W	Launch Vehicle, XVI
240.2	FM TEL	20 W	Launch Vehicle, XVII
241.5	FM TEL	20 W	Launch Vehicle, XVI
243.0	beacon	3 W	Spacecraft Recovery
244.3	PCM TEL	20 W	Launch Vehicle
245.3	PCM TEL	15 W	Spacecraft
248.6	PCM TEL	20 W	Launch Vehicle
250.7	FM TEL	20 W	Spacecraft
256.2	FM TEL	20 W	Launch Vehicle
258.5	PCM TEL	15 W	Launch Vehicle
259.7	VC	10 W	Spacecraft to Earth, Lunar Surface
279.0	VC/TEL	10 W	Space Suit
296.8	VC	10 W	Space to Earth
296.8	VC	100W	Earth to Spacecraft
450.0	TC	10kW	Earth to Launch Vehicle
2101.8	USB DL	10kW	Earth to Spacecraft
2106.4	USB DL	10kW	Earth to Spacecraft
2265.5	USB DL	8 W	Lunar Surface to Earth
2272.5	USB TEL	20 W	Spacecraft
2282.5	USB DL	20 W	Spacecraft
2287.5	USB DL	20 W	Spacecraft
5690.0	radar	3MW	Tracking Radar Interrogation
5765.0	radar	4.5kW	Spacecraft Radar Transponder
9580.0	radar	0.5 W	Spacecraft Landing Altitude
9792.0	radar	1.7kW	Spacecraft Rendezvous Radar
9832.8	radar	1.7kW	Spacecraft Rendezvous Radar
10510.0	radar	0.5 W	Spacecraft Landing Velocity

TEL—Telemetry, DL—Data Link, VC—Voice Communications, TC—Telecommand, PCM—Pulse Code Modulation, USB—Upper Sideband

tion KFXM on 590 kc is probably your best bet. If you live west of the Mississippi you shouldn't have too much difficulty on Monday mornings at 0100 PST.

Ironically, both the European and African deep-space communications sites are more easily logged by DXers. NASA's link in Madrid is only a few miles away from Radio Nacional de Espana's shortwave station, while NASA's deep-space facility near Johannesburg is not far from the powerful transmitters of Radio RSA.

Radio Nacional de Espana beams English-language broadcasts to the Americas every evening on 6140 kc and Spanish programs on 9360 kc. If you want a bit more of a challenge, try RNE's medium-wave broadcasts on 683 kc, heard from time to time in North America.

The Johannesburg facility, unlike the stations in Madrid and at Goldstone Lake, isn't owned by the U.S. It belongs to the South African government. Radio RSA programs often make much of the fact that Johannesburg has played a vital role in America's con-

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DXing NASA

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quest of space. Radio RSA's North American service is one of the more powerful voices of discontent to reach these shores and it's a cinch to log during evening hours (EST) on a variety of frequencies. These include 9560 and 9695 kc.

Australia, unfortunately, is a different matter. Things get tough when you start out on the track of the deep-space communications facilities operated by the Australian government for NASA. One, located at Canberra, is in the Capitol Territory, a tiny enclave surrounded by the state of New South Wales. The nearest shortwave station is located less than 100 miles away in Sydney and is operated by the Australian Broadcasting Commission. This station, VLI6, is heard occasionally in North America on 6090 kc around 0400 EST.

The second deep-space site—located at Woomera—is hairy, indeed. Station 5CL, located at Adelaide, South Australia, which broadcasts on a medium-wave frequency (730 kc), is the closest the author has come to DXing Woomera. With today's QRM, however, even logging 5CL on the West Coast is quite a feat. It's only due to a fluke in the ionosphere that low-power stations in the South Pacific can be heard. ●