

# Orbit

Journal of the Radio Amateur Space Program

**No. 13**

March/April 1983  
\$2.00 U.S.A./Canada



Published by AMSAT — The Radio Amateur Satellite Corporation



# Multimode Mobile Magic

## IC-290H & IC-490A

ICOM's latest state of the art 2 meter and 440MHz multimode transceivers.



### IC-290H

**25 Watts of Power.** A full 25 watts in all modes gives extra communication range in the IC-290H.

**Green LED Readout.** For improved readability in bright sunlight.

**Dual VFO's.** Provide ease in marking frequencies. Tuning rates are 5KHz in FM, 100Hz in CW and SSB, and 1KHz with the tuning speed button pushed.

**Priority Channel.** Any memory channel can be monitored for activity on a sample basis, every 5 seconds, without disruption of a QSO conducted on a VFO frequency.

**Adjustable Power Levels.** Both the hi and lo power levels are independently adjustable for meeting simplex or amplifier input requirements.

**Squelch in All Modes.** Standard noise squelch in FM and AGC derived squelch for CW and SSB reduce fatigue factors and allow scanning silently while looking for band openings or satellite signals.

**Multimode Capability.** FM, SSB, and CW modes provide solid communication modes for repeater, simplex, satellite or the CW enthusiast. Sidetone is provided on CW.

**Adjustable Duplex Splits.** Offset may be changed from its initial value by pressing the priority button while in VFO mode, then rotating the main tuning knob. The offset is displayed on the frequency readout.

**Scanning (S/S).** Memory scanning and full or programmable band scan are standard features. Internal switches select busy/empty modes, adjustable delay or carrier operated resume, and full or program band scan.

**Memory Backup.** The optional, heatsink mounted, BU1 memory backup battery option provides retention of memory when moving the transceiver from one power source to another.

**Touchtone® Microphone Supplied.** Each unit comes with a touchtone® microphone as the standard unit microphone.



### IC-490A

The operational characteristics of the IC-490A are the same as the IC-290H except for the features outlined in the following chart.

	IC-290H	IC-490A
Freq. Range (MHz)	143.8-148.199	430.0-439.999
Power	Hi 25 Lo 1	10 1
Memories	5	4
Initial Offset	600KHz	5MHz
1MHz Up Button	Not Req'd	Yes
Normal	FM1 5	5
Tuning Rates (KHz)	FM2 Not used SSB 0.1 CW 0.1	25 0.1 0.1

 **ICOM**  
The World System



March/April 1983  
Volume 4 Number 2

#### ORBIT Staff

Editor in Chief: V. Riportella, WA2LQQ  
Assoc. Tech. Ed.: Dom Mallozzi, N1DM  
Assoc. Editor: Harold Winard, KB2M  
Asst. Editor: Bob Ruedisueli, W4OWA  
Managing Editor: Bob Myers, W1XT  
Illustrations: Doug Dowie  
Advertising Dir.: Roger Soderman, KW2U

#### AMSAT Board of Directors

John Browning W6SP (Chairman), Tom Clark W3IWI, Rich Zwirko K1HTV, Jan King W3GEY, Pat Gowen G3IOR, Harry Yoneda JA1ANG, John Henry VE2VQ

#### AMSAT Officers

President: Tom Clark, W3IWI  
Exec. Vice Pres.: V. Riportella, WA2LQQ  
Sr. Vice Pres.: J. Champa, K8OCL  
V. P., Engineering: Jan King, W3GEY  
V. P., Operations: Rich Zwirko, K1HTV  
V. P. Special Projects: Bill Brown K9LF  
Asst. V. P., Eng. (Spacecraft):  
D. Connors, KD2S  
Asst. V. P., Eng. (System Analysis):  
Phil Karn, KA9Q  
Asst. V. P., Eng. (R&D):  
S. Robinson, W2FPY  
Asst. V. P., Ops. (S/C Ops):  
D. Loughmiller, KO5I  
Asst. V. P., Ops. (User Services):  
Ralph Wallio, W0RPK  
Treasurer: Roy Rosner, K4YV

#### Headquarters Office Staff

General Manager/Exec. Director:  
William Lazzaro, N2CF  
Office Manager: Martha Saragovitz

**Editorial Office:** P.O. Box 177,  
Warwick, NY 10990

**Advertising Office:** 221 Long Swamp  
Road, Wolcott, CT 06716

**AMSAT:** P.O. Box 27, Wash., DC 20044.  
Telephone: 301 589-6062  
Telex: 248-566

Second Class postage paid at Waterbury,  
Conn. by ORBIT, 221 Long Swamp Road,  
Wolcott, Connecticut 06716.

ORBIT (USPS 041-850) is published six  
times per year for \$10. (inseparable from  
membership dues of \$16).

Copyright © 1983 by AMSAT. Contents  
may be reproduced without specific per-  
mission provided proper credit is given,  
unless otherwise stated and copies are  
sent both to AMSAT and to the author.  
Opinion expressed is not necessarily that  
of AMSAT.

# CONTENTS:

## Technical Features:

- 4 **A Simple Dish for Mode-L** By Dr. John L. DuBois, W1HDX  
*Built for the W1HDX Phase III Command Station, you can  
build one too.*
- 7 **The Phase IIIB Transponders** By Werner Haas, DJ5KQ  
*AMSAT-DL Vice President examines the functional  
elements users will interface.*
12. **Satellite Data Collection and Analysis**  
By Robert J. Diersing, N5AHD  
*The AMSAT Software Exchange operator brings OSCAR to  
the classroom . . . Texas style.*

## Informational Topics:

- 15 **QRZed the Wyoming Station, Did You Say Mobile?**  
By Andy MacAllister, WA5ZIB  
*An eventful trip to a rare state provides enjoyable OSCAR-  
DX for many satellite ops.*
- 29 **"Fred Works OSCAR"** By Joe Kasser, G3ZCZ/4X  
*The conclusion of a three-part series.*
- 35 **New Ariane Launch Schedule** An ESA News Release.

## Departments:

- 3 **Ellipsis . . .** By Vern Riportella, WA2LQQ
- 22 **AMSAT News**
- 36 **Satellite Log** By Geoffrey Falworth
- 18 **Worldwide Satellite Activity** By Pat Gowen, G3IOR
- 20 **W6 Space Philosopher** By John Browning, W6SP
- 21 **Around the World** By Kaz Deskur, K2ZRO
- 34 **Orbit Predictions** By Phil Karn, KA9Q
- 27 **AMS/ T Association ByLaws**

---

**Our Cover:** Konrad Mueller of AMSAT-DL prepares to mate Phase  
IIIB and attach fitting to shake table test facility in West Germany,  
October, 1982. The solar panels have protective covers in place.

# LET'S TALK OSCAR

DATA IS DERIVED FROM OBSERVATIONS BY  
PROJECT OSCAR REPRODUCTION AUTHORIZED  
SELF-ADDRESSED STAMPED ENVELOPE  
OSCAR P.O. BOX 1136 LOS ALTOS CA 94024  
OF THE LATEST AVAILABLE DATA  
SUPPORT THE AMATEUR SATELLITE  
AMSAT P.O. BOX 27 WASHINGTON DC 20044  
COMPILED AND COORDINATED BY JOHN PRONKO W6XN  
RANDY COLE KN6R AND JACK SOMERS WA6VGS  
PRINTED BY Henry Radio



**AT HENRY RADIO  
WE'RE DEDICATED TO EVERY  
ASPECT OF AMATEUR RADIO  
...FROM THE EXCITING AND SOPHISTICATED  
TECHNOLOGY OF TODAY TO HELPING THE  
YOUNG NOVICE GET HIS FIRST SIGNAL ON THE AIR.**

**AND OUR OSCAR 8 & 9 ORBITAL DATA  
SHEETS AREN'T ALL WE HAVE TO OFFER**

- ★ "HAM IN SPACE" TEE SHIRTS
- ★ ORBIT MAGAZINE
- ★ QSL CARDS
- ★ L & R POLARIZED ANTENNAS
- ★ AMSAT BADGES
- ★ LINEAR AMPS
- ★ TRANSCEIVERS FOR OSCAR MODES A, B & J
  - ICOM
  - KENWOOD
  - YAESU
- ★ RECEIVING PRE-AMPS
- ★ ORBIT PLOTTERS
- ★ AZMUTH & ELEVATION ROTORS
- ★ ASTRON POWER SUPPLIES
- ★ ORBIT CALENDARS

**IN FACT, WE HAVE IT ALL...WE ARE OSCAR SPECIALISTS!**

HENRY RADIO leads the way. Let us answer your questions and help you with your needs. Give us a call—  
at the L.A. store ask for Jack (WA6VGS)



## Henry Radio

2050 S. Bundy Dr., Los Angeles, CA 90025 (213) 820-1234  
931 N. Euclid, Anaheim, CA 92801 (714) 772-9200

TOLL FREE ORDER NUMBER: (800) 421-6631  
For all states except California.  
Calif. residents please call collect on our regular numbers.



---

# Ellipsis...

AN EDITORIAL BY VERN RIPORELLA, WA2LQQ\*

---

North American amateurs recently witnessed a milestone in amateur radio communications. On the evening of March 3, ARRL President Victor C. Clark, W4KFC, sat in his modest home in rural Clifton, Virginia. But the rural setting would only bely the fact that at that moment Vic sat at the nucleus of an unprecedented amateur radio communications network.

Amateurs had established around Vic a network of terrestrial repeaters and hf links that would bring W4KFC into contact with tens of thousands of amateurs across 39 states and the Province of Ontario. The scope of this undertaking was breathtaking and its implementation by WØTN and his colleagues at the Honeywell Amateur Radio Club in Minneapolis was satisfying.

"Why," you might well ask, "is *Orbit* and AMSAT interested in the goings-on on those 'pedestrian' repeaters?"

Besides the fact that ARRL's Mr. Clark is an articulate individual with both mission AND message, *Orbit* believes there are other aspects that should not be overlooked. We are especially stimulated to look beyond the bedazzling technology and the polish of W4KFC's presentation to find a rich symbolism and the spectre of enormously powerful forces lurking.

It should seem apparent to those who've followed the evolution of amateur satellites that the day would come when OSCAR would cross the threshold to maturity. After an extended adolescence OSCAR appears ready for the rites of Spring to be played out in the jungles of French Guiana this June. The mature bird will offer the amateur world a communications tool unprecedented in history. In fact, there exists today no parallel nor does the commercial segment even offer the prospect of a communications tool so powerful as will be OSCAR 10. It is in the realm of communications power that we see parallels between W4KFC's presentation and the new OSCAR.

While with considerable skill and preparation WØTN and crew contrived the network which reached out to tens of thousands, it took coordination, consultation

and consternation to pull it together. With Phase IIIB, within a few months of the time you are reading this, a network of thousands could be pulled together very quickly indeed! The new OSCAR will view more than half the world's amateur population much of the time and up to 80% on occasion. The potential for great good is enormous. Unfortunately the potential for disruption also exists.

Every day that the new OSCAR orbits the earth will open new opportunities for amateurs to pull together to overcome the inherent problems that absence of reliable communications inevitably promote. Every day can mean an upgrade in the speed and accuracy with which important issues can be brought before the entire amateur radio community. Every hour can mean new inroads to easing the logjams of communications present in today's crowded hf bands.

How will amateurs respond to the challenge and potential of this new, powerful resource—this magnificent new communications tool? We are very optimistic about it. If we weren't we would have rolled belly-up when Phase IIIA took a bath. Surely there will be new problems to counter. Language problems and claims of "eminent domain" may arise. But given a spirit of cooperation by all combined with a healthy respect for the medium itself, we believe startup problems can be minimized. All it takes is a willingness to listen and cooperate in this new adventure we enter together.

The symbolism we saw in W4KFC's presentation was that of bringing technology to bear on a specific problem: getting across the ARRL message to amateurs. The result was certainly the high water mark for amateur radio communications power. But power comes in many "flavors". It is constituted of various forces. Throughout history the ability to inspire has universally led to power. The new OSCAR has built into it the potential for great power for good. With the inspiration of the greatest communication tool ever fielded by amateurs filling our sails, let us ply the ether for great good in what will always be recalled as the dawning of amateur radio's greatest age.