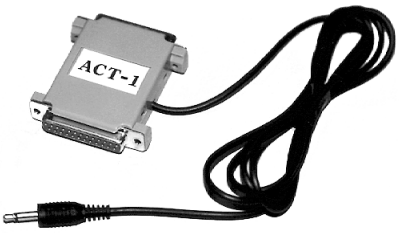
Introducing ACARS

■ ACARS FREQUENCIES

MHz	Function
131.550	Primary USA/Canada
130.025	Secondary USA
129.125	Tertiary USA
131.725	Primary Europe
131.450	Primary Japan
131.475	Private *Air Canada*

■ ACARS DECODERS



Universal ACT-1 Interface

This compact PC interface simply plugs into the serial port of your PC. The supplied user-friendly software includes mouse support. You can view, filter, print and save the data. You can also view, search and print previously logged data. Includes a free copy of the book *Understanding ACARS*. Under $100.

AOR ARD-2

Here is a "go anywhere" decoder for ACARS and NAVTEX. It provides portable operation from 4 internal AA cells (not supplied) or external 12 VDC, and a computer is not required. ACARS is the VHF teletype mode audible on most scanners. NAVTEX stands for Navigational Telex, sent predominantly on the longwave frequencies of 518 and 424 kHz, audible on most short-wave communications receivers. Incoming text is displayed on the 16 character by 2 line LCD display. A built-in speaker with volume control allows you to monitor activity. A 9600 baud DB9 serial port is provided for optional use with a personal computer. Under $400.

Aeronautical Radio, Inc. (commonly known as: "ARINC") maintains a huge VHF and HF voice network throughout the United States and overseas to provide operational radio communications for the aircraft industry. In the early eighties they developed an addressable, digital data link for commercial and business jets and their respective companies known as ACARS. ACARS stands for ***Aircraft Communications Addressing and Reporting System.*** It was produced to reduce the flight crew's work-load by using modern computer technology to exchange many routine reports and messages. This improves the safety and efficiency of modern air travel.

ACARS uses the AM mode because the same airborne VHF radio is often also used for voice communications. Burst transmissions are used with a limit of 220 characters per message. Transmissions often last less than one second! Therefore when monitoring ACARS it is important to leave your receiver's squelch off. To monitor ACARS transmissions you will need a VHF scanner or receiver capable of tuning the VHF (AM) aircraft band 118 to 136 MHz.

ACARS messages are very structured. Each position in the message has a specific function. The very common *Q0 Link Test* is shown as an example below.

❶ Address Field **❷ Message Label** **❸ Downlink Block Identifier**

.N9009U Q0**1**
5400UA1750

❹ Message Sequence Number **❺ Carrier & Flight Number**

There are nearly one hundred "standard" ACARS message formats plus a virtually unlimited number of airline specific company formatted message types. The following two examples are typical of standard ACARS message formats.

The **QG OUT/RETURN IN REPORT**, like many other ACARS downlinks, is transmitted automatically. Many ACARS downlinks are sent automatically as a result of on-board sensor activation, especially during takeoff and landings. This report is transmitted by an aircraft that leaves the gate, but for some reason must return back to the gate.

◆ QG - OUT/RETURN IN REPORT

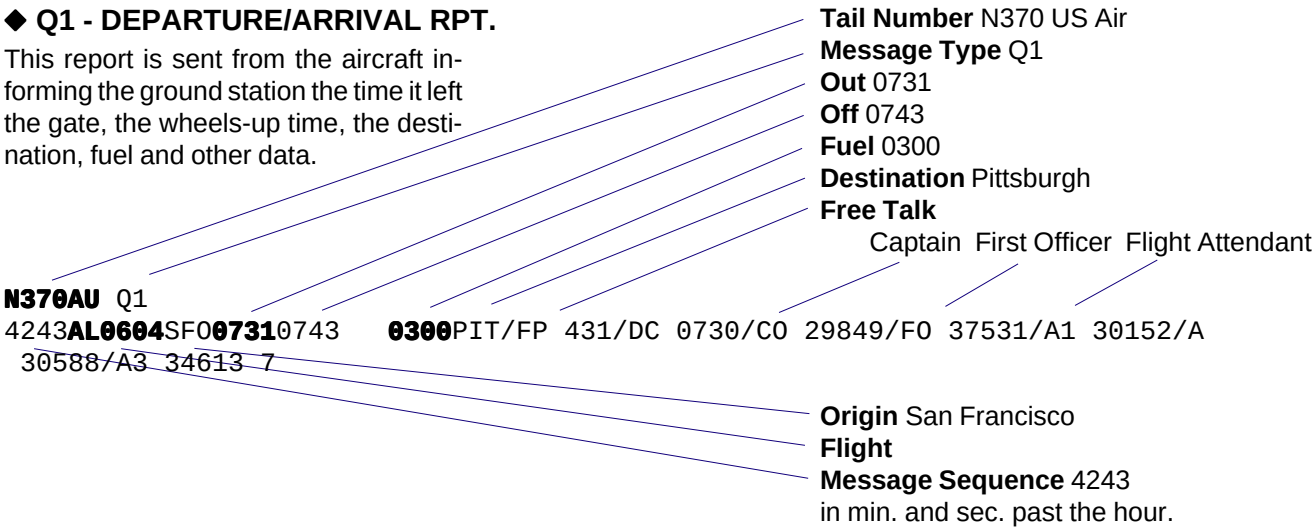
Tail Number N330AA
Message Type QG

.N330AA QG
3115AA001**SFO**0507**0516**

Return Back To Gate 0516
Out From Gate 0507
Origin San Francisco
Flight Number American #1
Message Sequence 3115
in min. and sec. past the hour.

◆ Q1 - DEPARTURE/ARRIVAL RPT.

This report is sent from the aircraft informing the ground station the time it left the gate, the wheels-up time, the destination, fuel and other data.



■ MESSAGE TYPES

Label		SMI	Message Title
_j			No info to transmit. Polled mode [1]
_DEL	⇳		General response, Demand mode; no information to transmit[1]
00	⇩	HJK	Emergency situation report
2S			Weather request
2U			Weather
4M			Cargo information
51			Ground GMT request response
52		AGM	Ground UTC request
54	⇳		Aircrew initiated voice contact request
57	⇩	AEP	Alternate aircrew initiated posit. rpt.
5D	⇩	TIS	ATIS request
5P	⇩		Temporary suspension of ACARS
5R	⇩	AEP	Aircraft initiated position report
5U	⇩	WXR	Weather request
5Y	⇩	ETA	Revision to previous ETA
5Z	⇩	AGM	Airline designated downlink
7A	⇩	ENG	Aircraft initiated engine data
7B	⇩	ABM	Aircraft initiated misc.message
80-9	⇩		Aircraft addressed downlinks
A1	⇧	CLX	Deliver oceanic clearance
A2	⇧	CLD	Deliver departure clearance
A4	⇧	RCA	Acknowledge PDC
A5	⇧	RPR	Request position report
A6	⇧	RAR	Request ADS report
A7	⇧	FTU	Forward free text to aircraft
A8	⇧	DDS	Deliver departure slot
A9	⇧	DAI	Deliver ATIS information
A0	⇧	AFN	ATIS Facilities notification
B1	⇩	RCL	Request oceanic clearance
B2	⇩	CLA	Request oceanic readback
B3	⇩	RCD	Request departure clearance
B4	⇩		Ackn. departure clearance
B5	⇩	PPR	Provide position report
B6	⇩	PAR	Provide ADS report
B7	⇩	FTD	Forward free text to ATS
B8	⇩	RDS	Request departure slot
B9	⇩	RAI	Request ATIS information
C0	⇧		Uplink msg. to all cockpit printers
C1	⇧		Uplink msg. to cockpit printer #1
C2	⇧		Uplink msg. to cockpit printer #2
C3	⇧		Uplink msg. to cockpit printer #3
CA			Printer status = error
CB	⇔		Printer status = busy
CC	⇔		Printer status = local
CD	⇔		Printer status = no paper
CE	⇔		Printer status = buffer overrun
CF	⇔		Printer status = reserved
F3	⇩		Dedicated transceiver advisory
H1	⇳		Message to/from terminal
HX	⇩	REJ	Undelivered uplink report
M1	⇩	MVA	IATA Departure message
M2	⇩	MVA	IATA Arrival message
M3	⇩	MVA	IATA Return to ramp message
M4	⇩	MVA	IATA Return from airborne message
Q0			ACARS link test
Q1	⇩		ETA Departure/arrival reports
Q2	⇩	ETA	ETA reports
Q3	⇩	CLK	Clock update
Q4	⇧		Voice circuit busy (response to 54)
Q5	⇔		Unable to process uplinked messages
Q6	⇩		Voice-to-ACARS change-over.
Q7	⇩	DLA	Delay message
QA	⇩	DEP	Out/fuel report
QB	⇩	DEP	Off report
QC	⇩	ARR	On report
QD	⇩	ARR	In/fuel report
QE	⇩	DEP	Out/fuel destination report
QF	⇩	DEP	Off/destination report
QG	⇩	RTN	Out/return in report
QH	⇩	DEP	Out report
QK	⇩	ARR	Landing report
QL	⇩	ARR	Arrival report
QM	⇩	ARR	Arrival information report
QN	⇩	DIV	Diversion report
QX	⇩		Intercept
RA	⇧	RPR	Command aircraft term. to transmit data
RB	⇩		Response of aircraft terminal to RA msg.
:;	⇧		Command aircraft xcvr to change freq.

[1] These are non-printing characters, and will not be displayed.

Message Direction
- ⇩ Downlink.
- ⇧ Uplink.
- ⇳ Uplink or downlink.
- ⇔ Ground to ground.

■ ABBREVIATIONS

0A	Passengers in first class	OF	Time off
0B	Passengers in business class	ON	Time on
0C	Passengers in coach class	OP	Oil pressure
AL	Flight level	OS	Other supplementary info.
CG	Center of gravity	OT	Time out or oil temperature
CI	Cost index	OV	Present location (over)
CL	Cruising level	PB	Number of persons on board
CR	Company route	PD	Point of departure
CW	Cruise wind	PW	Position weather
CZ	Cruising speed	QN	Altimeter settings
DA	Departure aerodrome	RD	Departure runway
DG	Drag factor	RF	Request flight level
DP	Dew point	RI	Return in time
DS	Destination station	RL	Requesting cruising level
E1-9	Engine parameters	RM	Remarks
EO	Estimated time over	RO	Return on time
FB	Fuel on board	RT	Route information
FC	Estimated further clearance	RL	Request cruising level
FD	Fuel over destination	SA	Latest weather
FF	Fuel flow factor in lbs/hr.	SI	Special communication
FI	Flight Identification	SK	Sky conditions
FL	Flight level	SL	Selcal code
FO	First officer	SP	Significant point
FR	Fault report prefix	ST	Standard takeoff power
FX	Enroute fix	TA	Static air temperature
GL	Geographical location	TB	Turbulence
HD	Aircraft heading	TD	Takeoff temperature
IC	Aircraft icing	TE	Time enroute
IN	Time in	TM	Surface air temperature
IR	In range (of VHF radio)	TO	Time over
LA	ID of officer landing aircraft	TP	Transmission path
LT	Light	V1	Velocity 1
MA	Message assurance	VR	Rotate speed (& runway vis rng)
MN	Maintenance	V2	Velocity 2
MT	Maximum takeoff power	WI	Weather
N1	Speed of turbine 1	WV	Wind information
NA	Navaid	WR	Warning prefix
NL	Number of landings	WX	Weather
NP	Next report point	ZW	Zero fuel weight

APRCH	Approach
ARINC	Aeronautical Radio Inc.
ATISRQ	ATIS request
AWDAF	Auto Wx Data-Area Forecast
AWDFT	Auto Wx Data-Terminal Area Forecast
AWDSA	Auto Wx Data-Air route Forecast
CLIMB	Climbing
CRUISE	Cruise level
DESCEN	Descending
INCLIMB	In climb
INRANG	In range of (VHF)
INRP	In report
LEVEL	Level flight
LIVE	Live cargo (animals)
OFFRP	Off report
ONRP	On report
OUTRP	Out report
PIREP	Pilot's report
POSWX	Position weather
TYP 1	Type 1 weather request
UDCST	Undercast sky
WXRQ	Weather request

AEP	ICAO position report with wx.
AGM	Start of standard message
ALT	Altitude
ALT	Altimeter
APP	Approach
AWD	Automated weather data
BBG	in reference to HAZMAT cargo
BKN	Broken
CHP	Chop
CLR	Clear
CPT	Captain
CRZ	Cruise altitude
CVG	Covering
DAI	Display aircraft itinerary
DBI	Data base initialization-update
DDG	in reference to HAZMAT cargo
DDX	Display dispatch message
DEV	Display aircraft deviations
DFR	Display flight routing
DLD	in reference to cargo
DTX	Display text
EDA	Engine data
EFC	Expect final clearance
EGT	Exhaust Gas Thrust
ENG	Engine data
EOK	Everything "OK"
EON	Expected touchdown time
EPR	Exhaust pressure ratio
ERR	Error message
ERT	Estimated ramp time
FDD	Flight data recorder info
FLR	Fault report
FLT	Flight
FOB	Fuel on board
FPR	Flight plan request
FRM	Maintenance codes
FTM	used before waypoint name
LIF	request for Load information
LND	Landing
MCH	Mach (aircraft speed)
MEL	Minimum essential list
OCC	Occasional (weather)
OFF	Off time
OUT	Out time
OVR	Over
POS	Position
PWD	Predicted weather data
RVR	runway visual range
SAT	Static air temperature
SMI	Standard message identifiers
SMT	Standard message text
TEI	Text element identifiers
TIS	ATIS information
TKO	Takeoff
TRB	Turbulence
TXT	Text
TYP	Type
VEC	Vector
WND	Wind (direction/velocity)
WOB	Weather observation
WRN	Warning
WXA	Weather at
WXR	Weather

■ AIRPORT IDENTIFIERS

IATA	ICAO	Airport
ATL	KATL	Atlanta, GA
BDL	KBDL	Hartford, CT
BER	EDBB	Berlin, GERMANY
BHM	KBHM	Birmingham, AL
BKL	KCLE	Cleveland, OH
BNA	KBNA	Nashville, TN
BOS	KBOS	Boston, MA
CDG	LFPG	Paris, FRANCE (de Gaulle)
CGX	KORD	Chicago, IL (Meigs)
CHC	NZCH	Christchurch, NEW ZEALAND
CHI		Chicago, IL
CMH	KCMH	Columbus, OH
CVG	KCVG	Cincinnati, OH (Covington, KY)
DFW	KDFW	Dallas-Ft.Worth, TX
DCA	KDCA	Washington, DC (National)
DEN	KDEN	Denver, CO
DTW	KDTW	Detroit, MI
EWR	KEWR	Newark, NJ
FCO		Rome, ITALY (Da Vinci)
IAD	KIAD	Washington, DC (Dulles)
JFK	KJFK	New York, NY (Kennedy)
LAX	KLAX	Los Angeles, CA
LGA	KLGA	New York, NY (La Guardia)
LGW	EGKK	London, ENGLAND (Gatwick)
LHR	EGLL	London, ENGLAND (Heathrow)
MCO	KMCO	Orlando, FL
MEM	KMEM	Memphis, TN
MDW	KMDW	Chicago, IL (Midway)
MEX	MMMX	Mexico City, MEXICO
MIA	KMIA	Miami, FL
MUC	EDDM	Munich, GERMANY
MSP	KMSP	Minneapolis/St. Paul, MN
MSY	KMSY	New Orleans, LA
NRT	RJAA	Tokyo, JAPAN (Narita)
NYC	KEWR	New York, NY (Newark-NJ)
OAK	KOAK	San Francisco, CA (Oakland)
ORD	KORD	Chicago, IL (O'Hare)
ORY		Paris, FRANCE (Orly)
PHL	KPHL	Philadelphia, PA
PIT	KPIT	Pittsburgh, PA
PWK	KPWK	Chicago/Wheeling, IL
SFO	KSFO	San Francisco/Oakland, CA
SLC	KSLC	Salt Lake City, UT
STL	KSTL	St. Louis, MO
SNN	EIAA	Shannon, IRELAND
TPA	KTPA	Tampa/St. Petersburg, FL
TPE	RCTP	Taipei, TAIWAN
YYZ	CYYZ	Toronto, ON-CANADA

■ FURTHER READING

Understanding ACARS *- Third Edition* By Ed Flynn
This detailed and informative book takes the mystery out of decoding ACARS. (Universal) Price: $ 9.95

The Worldwide Aeronautical Communications Frequency Directory *- Second Edition* By R.E. Evans
The most complete and up-to-date aero frequency directory ever published. Over 2350 frequencies covering voice and data on HF, VHF & UHF. (Universal) Price: $19.95

◆ PLAIN TEXT MESSAGES

The ACARS system can also be used to passing routine text traffic as in the following example:

```
.N908UA

ESTIMATING ARRIVAL
AFTER CURFEW, LOCAL
MANAGEMENT WILL
MAKE DECISION
WHETHER TO LAND
AFTER CURFEW OR
DIVERT. THIS
INFORMATION WILL BE
RELAYED TO FLIGHT
ENROUTE BY CHIEF.
PENALTY FOR CURFEW
VIOLATION WILL BE
HANDLED BY LGB.
(CHIDD PEK 07/28/
90)
```

This message was to a crew who was going to be late in landing at Long Beach.

■ AIRLINE CARRIERS

ICAO	IATA	Airline	Country
AAL	AA	American Airlines	U.S.A.
ACA	AC	AirCanada	Canada
AWE	HP	America West	U.S.A.
BAW	BA	British Airways	U.K.
COA	CO	Continental Airlines	U.S.A.
DAL	DL	Delta Airlines	U.S.A.
DHL	ER	DHL Airways	U.S.A.
FDX	MB	Federal Express Corp.	U.S.A.
FTL	FT	Flying Tiger Line	U.S.A.
FWL		Florida West Airlines	U.S.A.
HAL	HA	Hawaiian Airlines	U.S.A.
IBE	IB	Iberia Airlines	Spain
NWA	NW	Northwest Orient	U.S.A.
OZA		Ozark Airlines	U.S.A.
PAI	PI	Piedmont Aviation	U.S.A.
QFA	QF	Quantas Airways	Australia
SWA	SR	Swissair	Switzerland
TWA	TW	Trans World Airlines	U.S.A.
UAL	UA	United Airlines	U.S.A.
UPS	SX	United Parcel Service	U.S.A.
USA	US	U.S. Air	U.S.A.

IATA = International Air Transport Association
ICAO = International Civil Aviation Organization